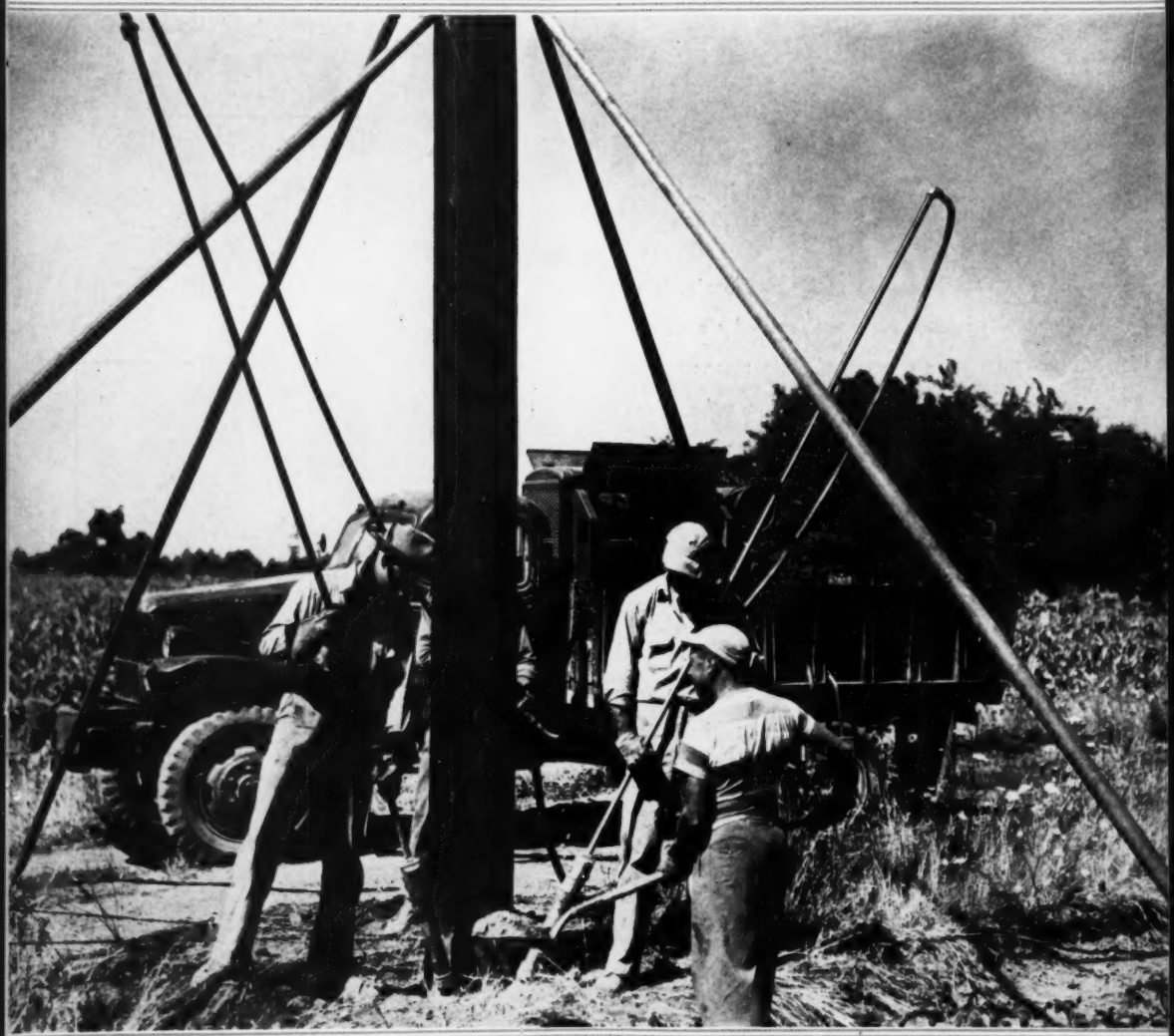
ELECTRICAL WEST

November 1951
25 cents



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Appliances, Page 91

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

Dryer weather!

Here in Central and Southern California, late fall and winter are better known by another name: the "rainy season." That means good weather for farmers—but bad weather for homemakers because washday drying becomes something of a problem.

However, the rainy season is the best time of year to tell homemakers about indoor drying and the best way to do it—the electric way, of course.

Chances are there'll be housewives coming into your store seeking the solution to the "wet weather" drying problem. They may well be prompted by these Edison newspaper advertisements on electric automatic dryers. They are more examples of the formula which has been effective for more than half a century: Edison tells them and the dealer sells them!

you're years ahead... and a yard ahead
when you dry clothes electrically!
SOUTHERN CALIFORNIA EDISON COMPANY
no "wet weather worry"
when you dry clothes electrically!
SOUTHERN CALIFORNIA EDISON COMPANY
it's the "end of the line"
when you dry clothes electrically!
SOUTHERN CALIFORNIA EDISON COMPANY
your clothes are softer, fluffier
when you dry clothes electrically!
SOUTHERN CALIFORNIA EDISON COMPANY

SOUTHERN CALIFORNIA EDISON COMPANY

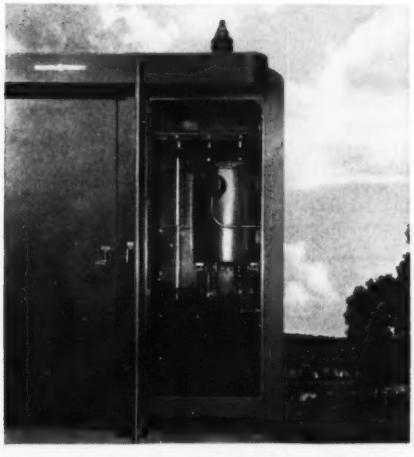
LOW-COST OIL SWITCH for capacitor installations

The Type B-1 Capacitor Switch was recently developed by General Electric to reduce the cost of switching capacitor banks. Designed with a high momentary current rating, a long contact life, and the ability to interrupt rated capacitor current without introducing abnormal overvoltages, the switch is being widely accepted. More and more housed capacitor equipments are being furnished with the switch, and a number of switches are being supplied for use with pole-mounted capacitor banks.

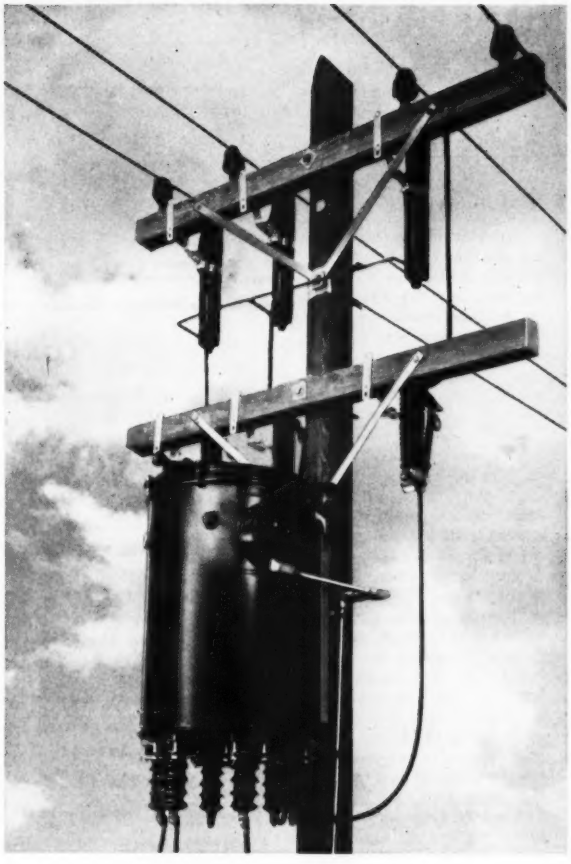
Rated 150 amperes, 15,000 volts, three-phase, the B-1 Switch will handle capacitor banks up to these kvars (includes 135% factor as outlined by NEMA).

450 kvar at 2,400 volts
800 kvar at 4,160 volts
900 kvar at 4,800 volts
1,350 kvar at 7,200 volts
2,400 kvar at 12,470 volts
2,700 kvar at 13,800 volts

Contact life—20,000 operations at 150 amp.
Momentary current—40,000 amp. RMS.



Within its maximum rating, this switch is considerably lower in cost than circuit breakers for capacitor equipments.



The B-1 Switch can be actuated by any control circuit which will supply one ampere at 120 volts, 60 cycles. It opens and closes all three phases with a double-break action, using six sets of arc-resisting contacts operating under oil. High-speed closing as well as opening is achieved by a toggle-actuated spring mechanism. A 1/30-hp motor charges the spring in approximately seven seconds. Tank diameter is 21 inches; over-all height, from top of tank to bushing terminal, is 43 inches; weight, including oil, is 500 pounds.

If this switch appears to have possible application on your system, ask for Bulletin GEC-801. A copy can be secured from your G-E Apparatus Sales Office, or by writing General Electric Co., Schenectady 5, N. Y.

407-34

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

NOVEMBER 1951

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S. The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal," "Journal of Electricity, Power and Gas" and "Journal of Electricity." Contents copyright. Sixty-third year of publication

VOL. 107 NO. 5

ELECTRICAL WEST

George C. Tenney, Editor
W. A. Cyr, Associate Editor — Walter C. Heston, Engineering Editor
Peggy Boyer, Assistant Editor — John Coetz, Typography

Next Month

For December there will be another of those labor-saving articles with a dollar sign on the saving. It is a front-mounted pole derrick, hydraulically operated, that can mount a working platform for line work to save climbing poles.

Big cranes do the heavy equipment moving jobs for one utility at great savings over other methods. That makes another good article with the dollar sign on savings.

The new Rock Island plant of the Chelan PUD will be a unique situation where a public body and a private utility both use the same dam on the Columbia. Features of the agreement that made possible the project and a description of the development make an informative article.

Infrared cooking and warming in the food serving business is making rapid strides. Four new installations will be treated pictorially.

An excellent drafting room lighting job with a luminous ceiling will give lighting men and contractors a new idea to sell.

We are working on an article dealing with the problem of service entrances for low-roofed houses. It will compare practices and standards in several states. Contractors, inspectors and the utility are all concerned. Look for the news letters, too.

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Cleveland (15) . . . . . Frank J. Seiler, 1510 Hanna Bldg.
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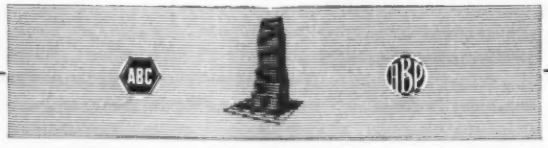
San Francisco (4) . . . . . Tom Carmody, 68 Post St., DO. 2-4600



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Another Example of L-M Leadership

L-M's ORTO

(oxidation-resistant transformer oil)

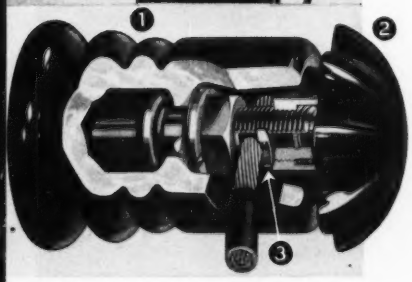
gives you all these advantages:

- longer life for the transformer, with the same overload capacity, or . . .
- higher overload capacity with the same transformer life
- reduced oil acidity and sludging
- maintained high impulse strength

and

- ORTO mixes with any other oil, conventional or inhibited
- ORTO will not react with other inhibitors
- ORTO is available as a *concentrate* for adding to your present oil stocks, for adding to power transformer oils, and for prolonging the life of reclaimed oil

Since its announcement, which led the industry, ORTO® has been a phenomenal success. Naturally L-M and L-M research engineers are gratified by ORTO's acceptance and this acceptance was deserved, by the long, rigorous careful checking into oils and inhibitors. New accelerated test methods were developed, to make sure that ORTO was as good as expected. ORTO was thoroughly tested and proved by extensive investigation and accelerated life tests representing many years of service.

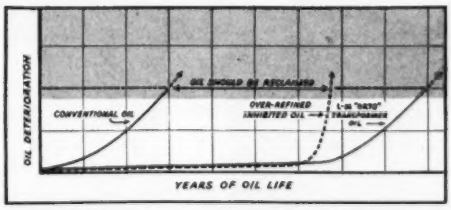


L-M'S NEW SIDEWALL BUSHING

For fast, permanent transformer connections. Heavy machined wet-process porcelain (1) with ample leakage distance. Extra strong finger-grip handle (2). Lineman inserts bared end of conductor into the connector (3), spins the knob tight. Hole only on one side of bushing; wire can't go through to snag clothes or cause accidental contact. Leak-proof, inherently siphon-proof; takes up to two full-size conductors.

L-M DISTRIBUTION TRANSFORMERS

Available in sizes up to 500 kva, voltages from 480 to 14,400, all ORTO-filled. Dry types 1½ to 50 kva, 600/120-240 volts.



Comparative curves show the deterioration of transformer oil in service. A high-grade conventional oil deteriorates at a gradually accelerating rate. Over-refined oils may have a better response to the inhibitor; but once the inhibitor has been used up, the oil has little resistance to oxidation, and deteriorates rapidly. ORTO brand oil is a high-grade conventional oil with an inhibitor which greatly extends the beginning of the deterioration, which, when it finally starts, assumes the same gradual curve as with any high-grade conventional oil.

Ask the L-M Field Engineer for information on ORTO; or write Line Material Company, Transformer Division, Zanesville, Ohio (a McGraw Electric Company Division).

LINE MATERIAL . . . Transformers

Complete Coordinated Equipment for Distribution Today

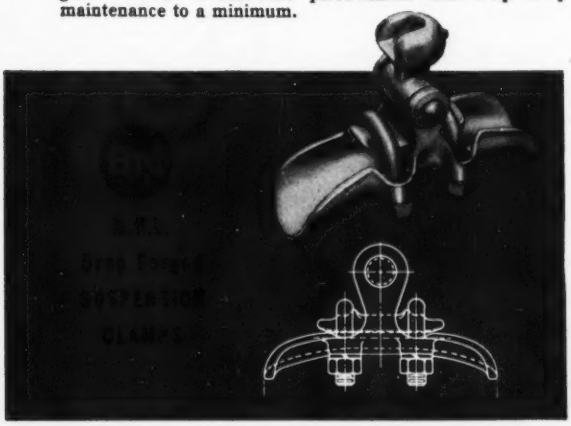
● MISSISSIPPI CROSSING High above the banks of the Mississippi, two mighty steel towers support this 2,922 ft. long high-tension span as it crosses the nation's most famous river. The span is part of Union Electric Company of Missouri's 138 Kv St. Louis transmission ring.

Drop Forged BTC *Hi-Line Hardware*

The **BREWER-TITCHENER**
Corporation
Cortland · New York

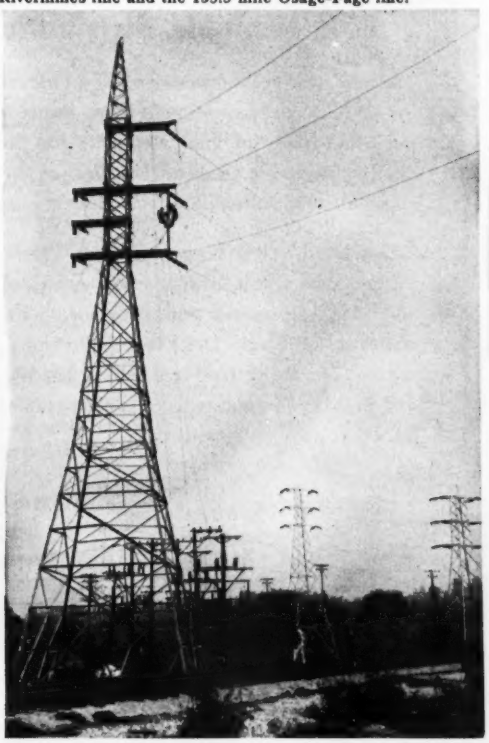
In 1950, Union Electric Company of Missouri added four new lines to its 138 Kv transmission ring around the city of St. Louis. Totaling some 46 circuit miles, these lines each have a 125,000 kva capacity . . . serve as a system tie line around the mid-west metropolis.

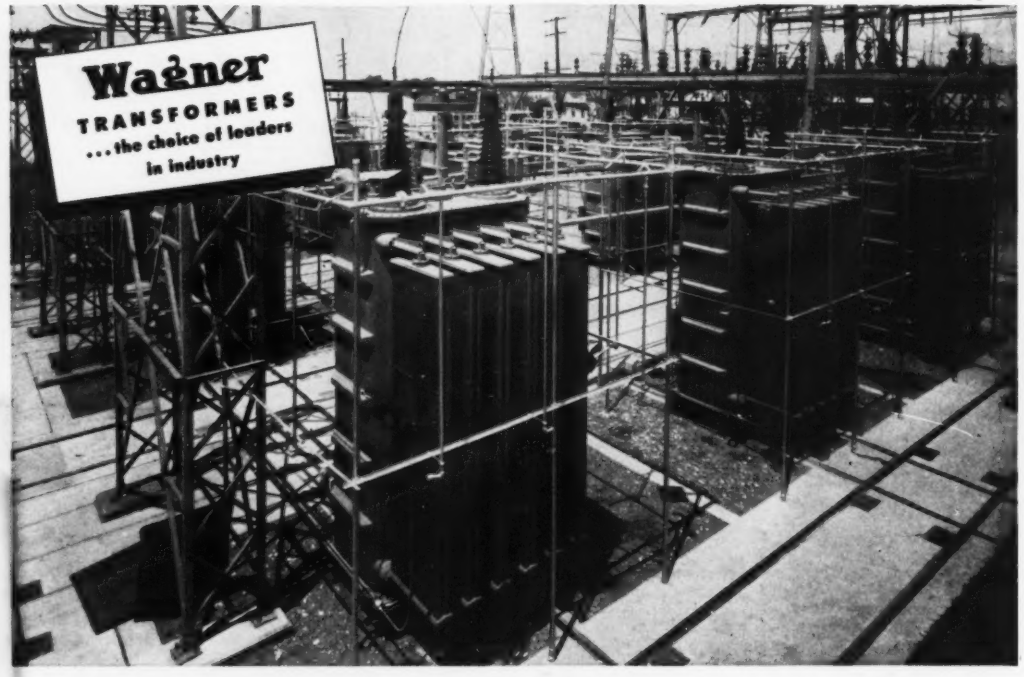
Union Electric Company . . . like so many of America's major power concerns . . . has used BTC Hi-Line Hardware for these links in its vital transmission ring. Insist on BTC Drop Forged Clamps and Fittings from your insulator manufacturer . . . you'll find that they're easier to install, give efficient trouble-free performance and help keep maintenance to a minimum.



Sold through your insulator manufacturer only.

● TWO MEN ON A TOWER Union Electric Company linemen work on this angle tower which supports a 138 Kv circuit, plus a 34.5 Kv circuit, on the company's Venice-Page transmission line. Other Union Electric Company lines employing BTC Hi-Line Hardware include the 119.5 mile Osage-Rivermines line and the 135.5 mile Osage-Page line.





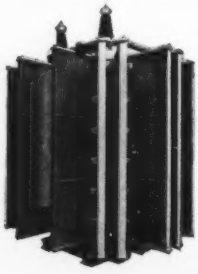
Wagner Transformers provide New Orleans Public Service dependable distribution of power for tomorrow

The new Midtown Substation of New Orleans Public Service, Incorporated, helps assure a plentiful supply of vital electricity for the steadily increasing needs of New Orleans and its rapidly-expanding industrial area.

The ten oil-filled Wagner Power Transformers used in this substation are each rated 5000 kva self-cooled, 6667 kva forced-air-cooled, 115,000 volts Delta to 13,800 volts Y, with full capacity taps at 110,000, 104,500, and 99,000 volts, and reduced capacity tap at 93,500 volts.

Wagner transformers are an important part of the equipment of many power companies because they have a reputation for unfailing dependability established through sixty years of service to the power industry. The complete story is told in Bulletin TU-181—you should have a copy.

Call the nearest of our 31 branch offices for competent advice on your next transformer installation.



WAGNER ELECTRIC CORPORATION
6381 Plymouth Ave., St. Louis 14, Mo., U.S.A.

Wagner Electric Corporation
1891 WE 1951

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

BRANCHES IN 31 PRINCIPAL CITIES

TU-11

"Off-the-Shelf" DELIVERY USING THESE STANDARDIZED COMPONENTS

New Square D MHP DISTRIBUTION PANELETTE

DESIGN LEADERSHIP

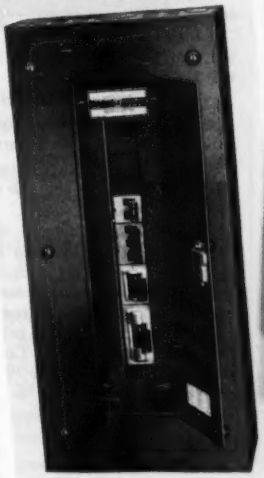
See Square D's new MHP CIRCUIT BREAKER DISTRIBUTION PANELETTE for 240 Volt, 3 Phase, 3 or 4 wire power systems. Varying job requirements can be met by using different combinations of standardized components available from Electrical Distributor stocks.

1 INTERIOR consists of three cylindrical bus bars, neutral plate and necessary barriers firmly supported on an insulated steel pan and equipped with a breaker-retaining trim plate held in place by four thumb screws. Unused breaker mounting space is covered by a scored sliding plate. Extra plate length is easily broken off.

2 "PLUG-IN" BREAKERS are thermal-magnetic. Positive pressure jaws tightly grip round bus bars. Available in 15 to 100 amperes, 240 volts A.C., two and three pole common trip units, for motor loads—15 to 50 amperes, 120 volts A.C., two individual trip single poles per unit, for lighting loads.

3 TRIM has door with directory frame and flush lock with standard keying. Available flush or surface.

4 BOX is 5¾" deep and either 14" (single row) or 20" (double row) wide. Available in four basic lengths with ample knockouts and large wiring gutters.



for descriptive bulletin, Write Square D Company, 4335 Valley Blvd., Los Angeles 32, Calif.

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

DETROIT • MILWAUKEE • LOS ANGELES

SQUARE D COMPANY CANADA LTD., TORONTO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.

You can profit

from Manchester's Experience

Quick, Easy Expansion with Westinghouse Network Transformers

Public Service Company of New Hampshire envisioned Manchester as a city sure to grow . . . power requirements certain to increase. That's why an underground secondary network system was installed . . . to give the flexibility needed to accommodate extensions, load shifts and future growth *economically.*

Already these predictions have come true. But the network system offered a simple solution. A number of new 500-kva Westinghouse Network Transformers were quickly and easily installed throughout the city.

Here's the transformer that offers greater savings in initial cost . . . and these *plus* features:

STANDARDIZED electrically and mechanically to meet industry requirements . . . to improve delivery and reduce costs.

CONTINUOUS WINDINGS with sliverless copper.

HIGH AND LOW-VOLTAGE COILS accurately centered to minimize short-circuit stresses.

SINGLE RESPONSIBILITY—transformer, network protector, rotary switch all supplied by one manufacturer.

Westinghouse helped develop the network system over 29 years ago and has continuously pioneered new developments. Complete facilities including board analysis and competent engineers can help with your system planning. Call your nearest Westinghouse representative or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-70614

YOU CAN BE SURE... IF IT'S
Westinghouse

NETWORK TRANSFORMERS

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

3 months old and making safety switch history!

BULLDOG VACU-BREAK MASTER SAFETY SWITCH

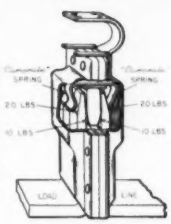
A Type A Switch at Type C prices!

Switch users hail BullDog safety switch simplification program. Now, one great line of 38 BullDog Vacu-Break Master Switches fills all safety switch requirements! Type A switches . . . at C prices . . . possible only by concentrating switch production on one sensible, simplified line. Just 38 switches . . . instead of hundreds . . . to save you time, money, effort whenever you order, use, stock Type A, C or D safety switches.

All the famous BullDog features

EXCLUSIVE CLAMPMATIC CONTACTS!

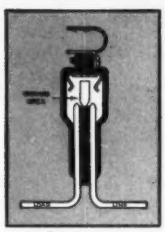
"Clampmatic" is a method for obtaining extra and enduring contact pressure between switch jaws and blades. In ordinary switches, jaws exert about 10 lbs. pressure on blade. In Vacu-Break Switches, the Clampmatic spring augments this with 20 lbs. pressure on both "line" and "load" sides of jaws. Thus, Clampmatic provides a total of 30 lbs. of contact pressure between both sides of blade and jaw for "bolt-tight" contact.



VOIDABLE COVER INTERLOCK!

Interlock: With interlock pin at Hole A, cover cannot be opened unless switch is OFF. Cover must be fully closed to throw switch ON.

To void interlock: Simply push interlock up and insert interlock pin in Hole B. Switch can then be thrown ON or OFF with cover open or closed.



EXCLUSIVE VACU-BREAK PRINCIPLE!

Dangerous arcs are quickly snuffed out by lack of oxygen in BullDog's exclusive Vacu-Break arcing chamber. This eliminates excessive arcing which, in ordinary switches, causes burning, pitting and rapid deterioration of contacts. Thus, the BullDog Vacu-Break chamber materially reduces switch maintenance.

including

- Quick-make and quick-break
- Anti-creepage corrugations on switch bases and arc chambers
- Solderless cable terminals (wire grips)
- Horsepower-rated
- Silver-surfaced current-carrying parts
- Spring-reinforced fuse grips
- Ample supply of concentric K.O.'s
- Generous wiring space in all switches

BULLDOG SCORES AGAIN!

Just 38 great Master Vacu-Break Switches replace hundreds of Type A, C and D safety switches.

WRITE DEPT. 453-B FOR DESCRIPTIVE FOLDER

BULLDOG ELECTRIC PRODUCTS COMPANY

DETROIT 32, MICHIGAN • FIELD OFFICES IN ALL PRINCIPAL CITIES

IN CANADA: BULLDOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO

BULLDOG

THE LEADER IN FLEXIBLE ELECTRICAL DISTRIBUTION

Sangamo Polyphase Meters

GIVE YOU THE ADVANTAGES OF SINGLE DISK AND SMALL SIZE—

even in 3 Element Types

Type LC-3-P
3 element, self-contained. For 4 wire, 3 phase Y circuits.

Type LC-3-S
3 element, self-contained. For 4 wire, 3 phase Y circuits.

* Only a minimum of space is necessary for mounting either 2-element or 3-element Sangamo polyphase watthour meters for power metering on all commercial and industrial applications.

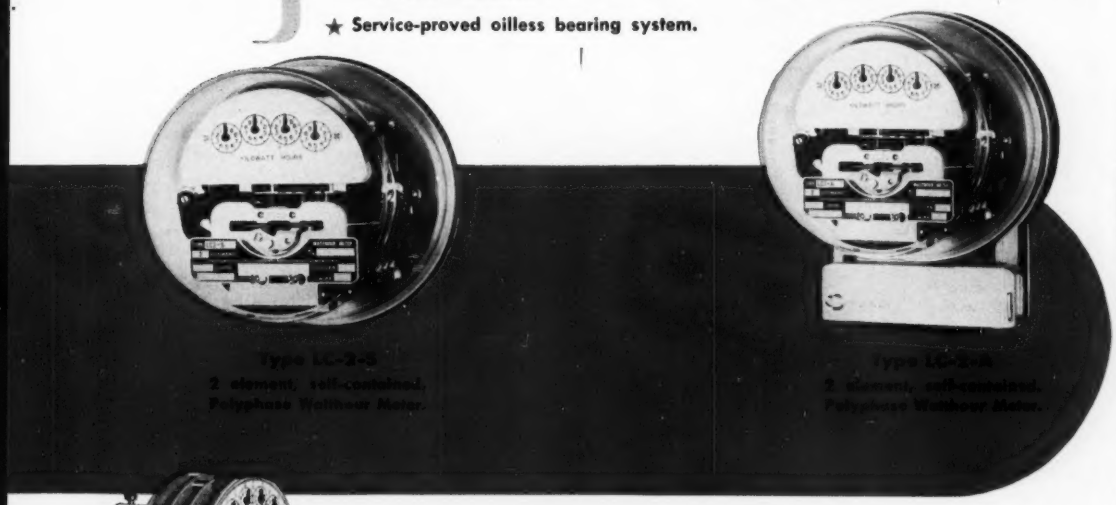
The complete Sangamo Type LC polyphase line, whether 2, 2½ or 3 element meters, have *single disk* construction which permits their manufacture in the *smaller* sizes required of modern meters for standard "A" "S" or "P" mountings.

Mechanical stability—electrical characteristics—full temperature and overload compensations—resulting from the modern design features of Type LC meters, assure dependable service and high accuracy of measurement over the entire load range up to 400% of meter rating.

SANGAMO

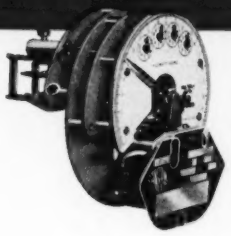
Design features

- ★ Driving element, moving system and register all mounted on one die-cast supporting grid, assuring permanent mechanical relation of all component parts.
- ★ Damping magnets of alnico are highly resistant to the demagnetizing effect of lightning surges and stray fields.
- ★ A basic constant of 0.6 watthours per disk revolution for each element, producing excellent inherent overload and voltage characteristics.
- ★ Service-proved oilless bearing system.
- ★ Generous design of copper in current coils provides high thermal capacity on overloads.
- ★ High insulation levels of potential and current elements. Also terminal insulation highly resistant to arc tracking.
- ★ Micrometer adjustments for full load, light load, power factor and element balance.
- ★ Easy accessibility of all parts for inspection and adjustment or replacement.



Type LC-2-S
2 element, self-contained,
Polyphase Watthour Meter.

Type LC-2-A
2 element, self-contained,
Polyphase Watthour Meter.



For convenient, dependable demand measurement on all polyphase circuits use Sangamo Type LCH demand registers on Type LC meters. These registers are timed by the new Sangamo low speed, high torque, hysteresis type motor, lubricated with a silicone of constant viscosity over wide temperature ranges. Years of troublefree operation are assured without expensive maintenance. Bulletin 321 gives complete information.

Write for Bulletin 240 for detailed information on LC Meters.

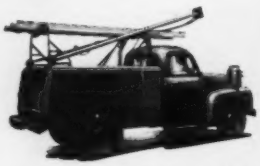
SANGAMO ELECTRIC COMPANY

SPRINGFIELD, ILLINOIS

5351-6

LINE CONSTRUCTION BODY (500)
Medium and heavy duty work. Vertical compartments are optional . . . can be equipped to fit individual needs.

REVOLVING AERIAL LADDER
Models available in working heights of 23' 6", 26' 6", 30' 6", and 32' 6" for all styles of bodies.



LIGHT DUTY MAINTENANCE BODY (350)
Fold-over type derrick will handle poles up to 40' in length. 24' ladder extends from rear of body.

HYDRAULIC TOWER
Available in sizes from 21' to 30'. Platform revolves full 360°. Tower can be operated from cab or platform.

There are many styles of *Powers-American* Bodies not shown here. Write for descriptive catalog today.

UTILITY WORKHORSE-

FOR LONG LIFE AND TROUBLE FREE SERVICE

All *Powers-American* bodies have *earned* the reputation of "workhorse" of the utility industry by years of faithful performance. No matter how tough the job or the operating conditions, they pull more than their share of the load by stepping up crew efficiency and lowering operating costs. Whatever your utility body needs, *Powers-American* is your *1* source for *all types* of utility bodies and equipment. Write today for more information. Put a *Powers-American* "workhorse" on your job and watch the team pull ahead!

"The Accepted Standard with Utilities Everywhere"

LINE CONSTRUCTION BODY (600)
Completely equipped to carry all tools and materials needed for line work. Can be furnished with winch and derrick, compressor, digger, or any special equipment required . . . for use in any phase of the utility industry. Available in 9' to 14' lengths, with or without built-in crew compartment.

POWERS *American* DIVISION
ACB

PUBLIC UTILITY BODIES AND EQUIPMENT
McCABE-POWERS AUTO BODY COMPANY
432 Fifth Street, Oakland 7, California

This Wide Acceptance is No Accident!

NETWORK TRANSFORMERS have to be tougher than most transformers. Not only are they subject to temperature extremes and overloads, but they have to withstand unusually severe operating conditions, flooding and corrosive atmospheres. Because they may have to operate in narrow, below-sidewalk vaults, maintenance is an important factor to consider.

That's why utility engineers are particular about the network transformers they choose for their systems.

One of the best testimonials to dependable all-around performance of Allis-Chalmers network transformers is the increasing approval of utilities and consulting firms throughout the country. Today the A-C label on major electrical systems is a familiar sight. Approximately 1¼ million kva of Allis-Chalmers network transformers are now serving the most important systems in the country.

This vote of confidence is based upon top performance. Details of welding, protective undercoating, convenient location of gages, sturdy core and coil construction and tank design make this outstanding performance possible.

Allis-Chalmers makes all three types of network transformers: oil-filled, *Chlorextol* liquid-filled and the new sealed dry type. Your Allis-Chalmers engineer can make unbiased recommendations on the best type for your particular requirements.

Why not call your local A-C office for more information. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 61B6152A. A-3515

Chlorextol is an Allis-Chalmers trademark.

LOOK

To Allis-Chalmers Network Transformers For:

● **Compactly designed** circular coil structure. Outside core clamping bolts, sturdy turn-to-turn insulation, built to withstand heavy short-circuit stresses. Thermal capacity is high for cool operation under severe load conditions.

● **Strong construction.** Main cover and switch compartment are welded to the tank to do away with gasket trouble.

● **Easy control** of tap changer operated through a two-inch outlet in the main cover. Eliminates packing gland maintenance.

● **Extra protection** of undercoating compound . . . plus sandblasting and three coats of baked-on phenolic base paint formulated to give high water resistance.

ALLIS-CHALMERS

Network Transformers—Over 1,000,000 KVA Installed

Cables run COOLER...
in TRANSITE DUCTS

... reducing copper losses
... increasing current capacity
... prolonging insulation life

YOU REDUCE copper losses ... increase current carrying capacity ... and prolong insulation life, when you run your cables in Transite* Ducts.

Current carrying capacities can be increased in a typical duct bank as much as 5%, or I^2R losses can be reduced 11%, for cables located in Transite as compared with other ducts used for power circuits.

And, Transite Ducts assure permanent duct banks because Transite is incombustible; is immune to rust and rot; is unaffected by electrolysis; will not slag under action of an arc, and will retain its high original strength.

An unusually smooth bore assures no injury to cable sheath, either in natural movement under load, or when pulling-in cables. Long, lightweight lengths can be quickly and economically installed. In addition, a full line of fittings simplifies even the most complicated of installations.

For full information on Transite Ducts, write for Data Book DS-410. Johns-Manville, Box 290, New York 16, N. Y.

*Reg. U. S. Pat. Off.

How Transite Ducts increase current carrying capacities

Type cable 3 cdr. 500 MCM Compack Sector, 15 KV (6th Edition AEIC Spec.)
No. of cables—3 (all loaded in one bank)
Daily Load Factor—75%
Earth Temp. ambient—20 C

	Transite	Other
Total Therm. Res. to Dielectric Loss (C watts/ft.)	5.66	6.17
Total Therm. Res. to Copper Loss (C watts/ft.)	4.44	4.95
Temp. Rise from Dielectric loss (C)	1.9	2.1
Allowable Rise for Copper loss (C)	59.1	58.9
Allowable Watts per ft. cable	4.44	3.96
Allowable Current—(Amps. per cdr.)	386.	365.
Allowable Current—(Relative %)	105.6	100.

Johns-Manville *Transite Ducts*

TRANSITE KORDUCT—for installation in concrete

TRANSITE CONDUIT—for exposed work and installation underground without a concrete encasement

Rely on Quality

INDUSTRIAL

PYLE-NATIONAL LIGHTING FIXTURES

for longer service life, added Safety and Efficiency

EXPLOSION-PROOF

Pyle-National LE Series (Class 1, Groups C and D)

For use in locations where highly flammable materials are manufactured or handled.

Rugged, flame-tight cast aluminum alloy housings render internal explosions harmless, and insure safe operating temperatures. Threaded construction permits easy access to interior for wiring and lamp replacement. Available in many types and sizes.

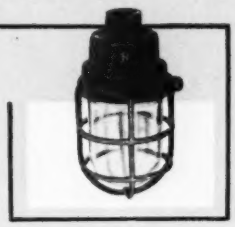
DUST-TIGHT

Pyle-National DE Series (Class II, Group E, F, G and Class III)

For use in locations where flammable dusts are present in quantity.

Strong, one-piece cast aluminum alloy housings are designed to exclude dust from the interior and to avoid accumulation of dust on the exterior surface. Available in many types and sizes.

VAPOR-TIGHT



Pyle-National BO Series

For use in any outdoor or indoor location subjected to heavy concentrations of non-flammable vapors, gases, dusts, or moisture.

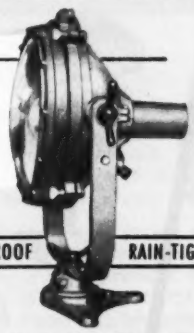
Heavy duty construction and especially efficient sealing features insures an exceptionally long service life. Full line for 10 to 200 watt lamps.

VAPOR-TIGHT SIGNAL OR PILOT LIGHTS

Midget Fixtures for 10 watt Lamps.

ENCLOSED FLOODLIGHTS

Sealed against moisture and dirt, constructed throughout of cast aluminum and other rugged, corrosion-proof materials, Pyle-National floodlights retain their original high-efficiency output throughout an exceptionally long service life, with negligible maintenance and replacement expense.



WEATHER-PROOF RAIN-TIGHT

SINCE 1897

THE PYLE-NATIONAL COMPANY

1364 N. KOSTNER AVENUE • CHICAGO 51, ILLINOIS

District Office and Representatives in Principal Cities of the United States. Export Department: International Railways Supply Co., 30 Church St., New York. Canadian Agent: The Holden Co., Ltd., Montreal, Toronto, Winnipeg, Vancouver.

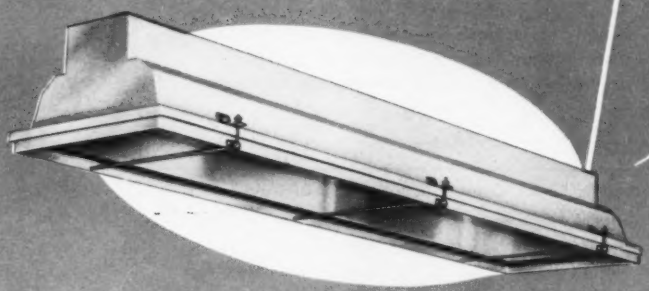
CONDUIT FITTINGS • PLUGS AND RECEPTACLES • TURBO-GENERATORS • GYRALITES • MULTI-VENT AIR DISTRIBUTION

WESTERN SALES AGENTS

SAN FRANCISCO 6, CALIF.	LOS ANGELES 12, CALIF.	SEATTLE 4, WASH.	DENVER	PORTLAND 14, OREGON	SPOKANE 8, WASH.
Hodges & Glomb 1264 Folsom St. UNderhill 1-2367	Henger-Seltzer Co. 120 S. Hewitt St. MAdison 2631	Shaffer & Nelson 312 Occidental Ave. MUtual 0186	Sales Engineers, Inc. 1440 11th Street	Shaffer & Nelson 411 Weatherly Building East 6639	Shaffer & Nelson 824 Realty Bldg. MA 8370

Notes on Quality LIGHTING:

Here in the West the installation assuring maximum lighting efficiency with minimum service and maintenance is, by every standard of comparison, SMOOT-HOLMAN. The hallmark of quality in better buildings is the presence of SMOOT-HOLMAN equipment.

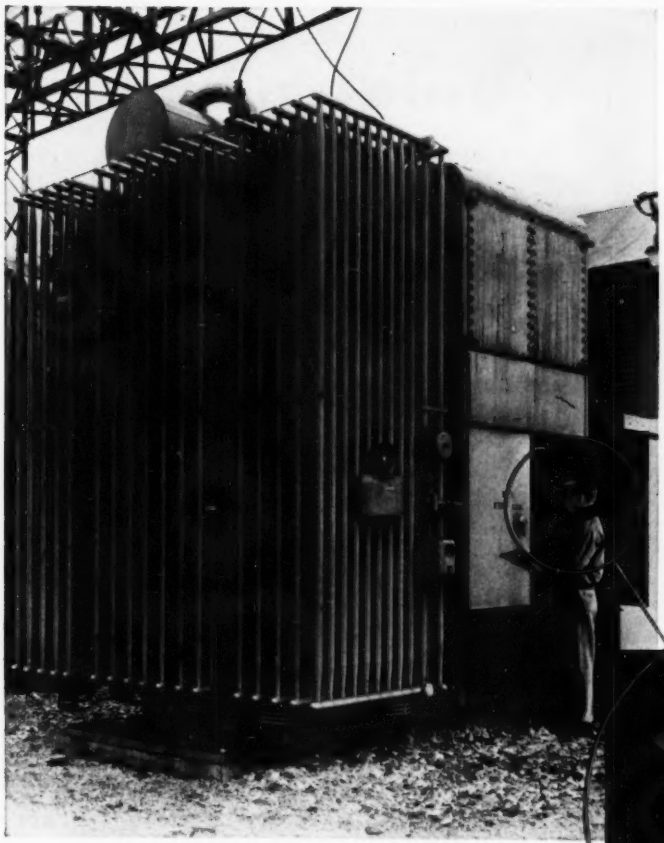


The New D-P Seal-Lux, *pictured above, is a vapor-light fluorescent luminaire built for high efficiency and rugged service life under the most exacting conditions.*

1 Constellation Slimline fluorescent
2 D-P Line-Light
3 Collegiate Slimline fluorescent
4 Educator incandescent
5 RLM Standard Dome Reflector
6 The Master floodlight
7 LH Ceiling light

ILLUMINATION EQUIPMENT
SMOOT-HOLMAN
INGLEWOOD, CALIFORNIA
MADE IN U.S.A. ®

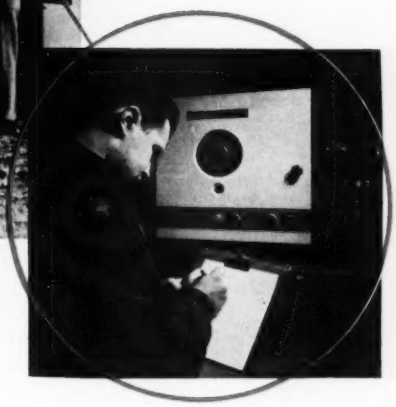
SMOOT-HOLMAN COMPANY Inglewood, Calif. Offices in Principal Western Cities • Branch and Warehouse in San Francisco



General Electric transformer rated 6000/7500 kva, 33-kv, installed on Indianapolis Power & Light System. Load-ratio control in low-voltage winding provides ±5% voltage regulation.

Prediction:

14 years of tap changes without any servicing



This particular G-E transformer will operate 14 years at its current rate of 20 tap changes a day before its load-ratio-control equipment requires servicing. This means that for 14 years the maintenance crew will not have to clean insulating surfaces or filter the contactor oil! In fact, the contactor compartment need not be opened during this entire period.

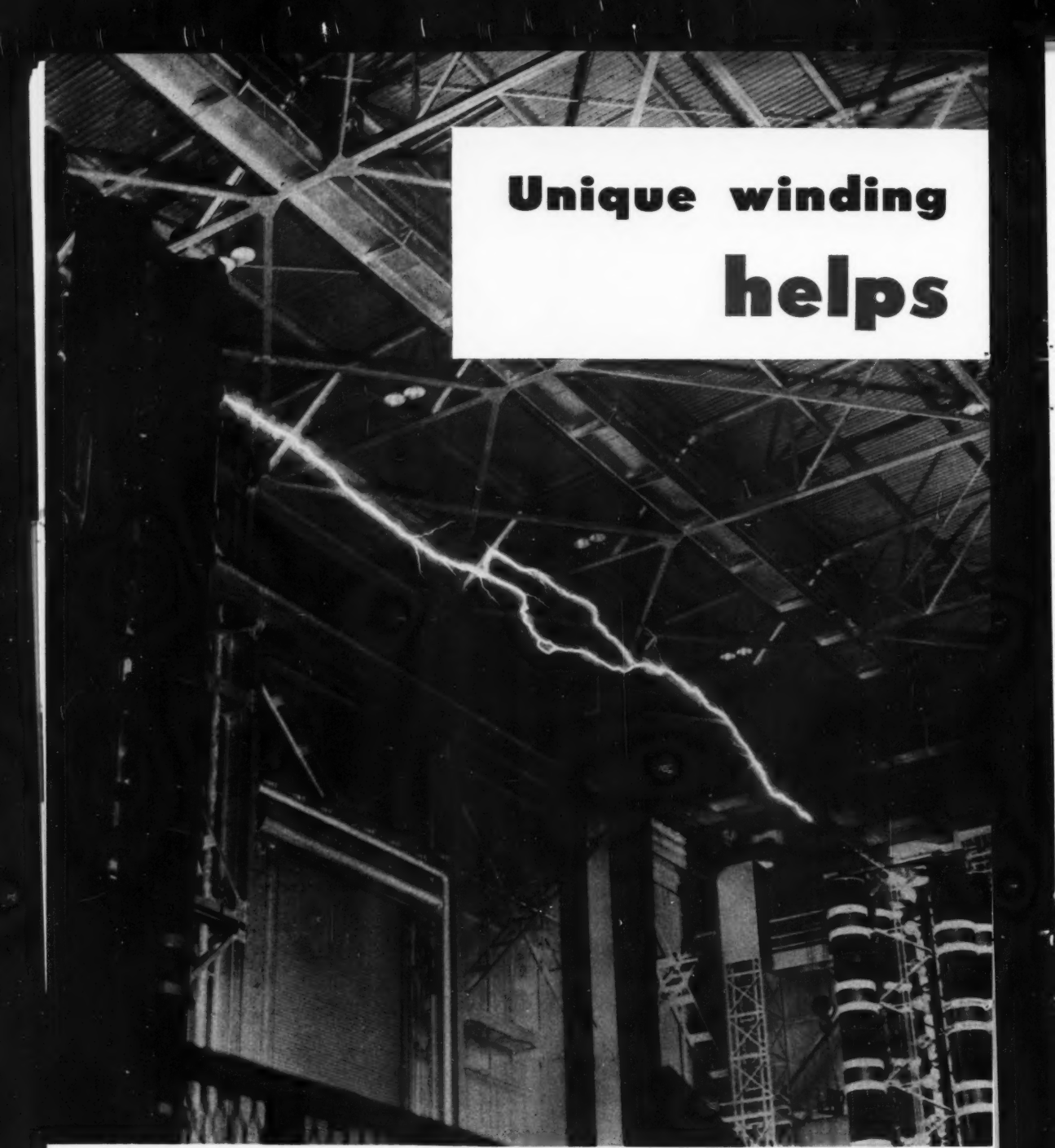
The really significant point, however, is this: We can tell you—and do tell you for each transformer—how many operations the LRC equipment will make before any servicing is required. We have tested the contacts of each design until we know, accurately, the life of the arcing tips. By the use of electrostatic shielding, and by having a major portion of creepage distances in the vertical plane, we prevent dangerous deposits of carbon from forming on insulating surfaces during this period.

In other words, with G-E load-ratio-control equipment, you don't do any *unnecessary* service work. You simply refer to the instruction book and read the counter to predict the time that servicing is actually required.

Over 37,000,000 installed kva have proved that General Electric LRC is as reliable as the core and coils themselves. Call on your G-E representative for a complete discussion on the LRC transformer best suited to your application. *General Electric Co., Schenectady 5, N. Y.*

401-18

GENERAL ELECTRIC



Unique winding helps

A story without an end. Here, in our new High Voltage Engineering Laboratory, is man-made lightning—a 15,000,000-volt surge—a spectacular example of the research tools General Electric provides its team of transformer engineers and scientists. As a result of studies made here, shielded windings and the balanced, two-section coil were developed to distribute surge voltages more uniformly throughout the coil.

This unbeatable G-E combination of brains, plus the finest equipment, helped develop Spirakore's many outstanding advantages. Besides progressive layer insulation, there's our special paint (Melaglyp†) that increases weather durability by 50 per cent, and air-tight sealing that prolongs oil and transformer life.

Yes, in *all* respects Spirakore leads the field. And with continuing G-E research, Spirakore will *always* be the standard for others to try to equal.

†A new, greatly improved G-E paint made with melamine-modified Glyptal (registered trademark of the General Electric Co. for alkyd resin).

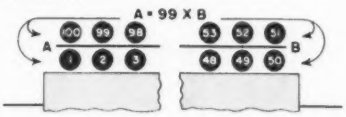
SPIRAKORE* TRANSFORMERS

method...

lick lightning

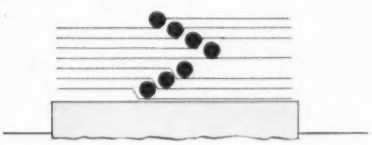
Lightning used to spell death for numerous high-voltage distribution transformers every year. Yet since the early '40's, such failures have been almost non-existent where Spirakore high-voltage transformers were used.

Reason? Progressive layer insulation is one of the reasons. This unique winding method provides the greatest strength where the stress is greatest, thus compensating for the difference in layer-to-layer voltage stress—both normal and impulse—that occurs from one end of the coil to the other.



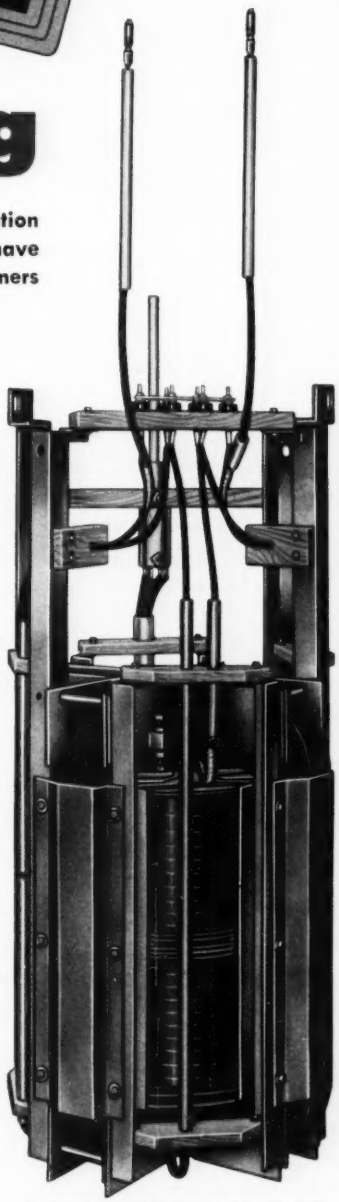
For example, if each layer of windings consists of 50 turns, the 100th turn falls directly over the 1st turn. (See diagram.) Consequently, the voltage stress at this point (A) is 99 times greater than at the opposite end of the winding (B). And at the moment of a high impulse through a high-voltage transformer, these layer-to-layer stresses may vary by as much as 5,000 volts.

Progressive layer insulation helps lick this problem by keeping the insulating strength proportional to the stresses. This is done by winding a *full layer width* of paper dielectric into the coil along with each turn of the conductor. Hence, as turns are added, the layers of paper increase and keep the insulation proportional to the voltage stress—both normal and impulse. And the multiple thicknesses of insulation provide higher dielectric strength than a single sheet of the same total thickness.



Consequently, you get that *extra stamina* that keeps Spirakore transformers always on the job. Check your records over the past ten years—you'll see how thoroughly Spirakore has licked the lightning problem. *General Electric Company, Schenectady 5, N. Y.*

*Registered trademark of the General Electric Co.



All Spirakore transformers, rated over 15,000 volts, have progressive layer insulation.

GENERAL ELECTRIC

402-113

The controls on all station-type feeder voltage regulators now meet rigid ASA Standards for Class I accuracy. This means they have an accuracy of at least 99%.

Induction Voltage Regulators require less maintenance

- **No contacts in the main circuit**
- **No cams or springs or elaborate gear trains**
- **No mechanical brake to adjust, no separate braking circuit**
- **Nothing to lubricate—complete operating mechanism (including the motor) immersed in oil**
- **Even the oil lasts longer—because the tank is sealed to stop all breathing**

And remember—G-E induction voltage regulators give accurate, stepless regulation of the highest quality obtainable. Rugged simplicity and the absence of time-delay makes them ideally suited for use on distribution circuits where loads are heavy, voltage variations are frequent, and prompt response to voltage change is essential.

Bulletin GEA-2985 gives full information. A copy can be secured from your G-E Apparatus Sales Office, or by writing *General Electric Company, Schenectady 5, N. Y.*

The General Electric IRS Induction Voltage Regulator has only three shafts, including that of the motor. All are mounted on enduring roller or ball bearings; all operate under oil. Wear is negligible. One gear train, a double-worm reduction, provides a drive that is simple, silent, self-locking and positive. There are no ratchets, no pawls, no chains to introduce uncertain operation and questionable life. No special braking circuits are used. The capacitor that gives the motor its high starting torque promptly throttles its rotation when the motor supply circuit is opened.

404-79

GENERAL ELECTRIC

You can't buy Better Fittings or ones that cost less to use

Cross Section Showing Indentations.

Quicker to use and neater in appearance, Briegel All-Steel Indenter Fittings not only make stronger connections but also make each job more profitable to the contractor and satisfactory to his customers.

Two Easy Squeezes and they're set to stay. It is only natural that the Briegel All-Steel Indenter Fittings are the most widely used E.M.T. connectors and couplings. Contractors the world over recognize their cost cutting qualities and the fact that they make each wiring job neater, stronger and better.

All B-M Fittings Carry the Underwriters Seal of Approval

BRIEGEL METHOD TOOL CO.

GALVA, • ILLINOIS

DISTRIBUTED BY

The M. B. Austin Co., Northbrook, Ill.; Clayton Mark & Co., Evanston, Ill.; Wagner Malleable Products Co., Decatur, Ill.; Clifton Conduit Co., Jersey City, N. J.; General Electric Co., Bridgeport, Conn.; The Steelduct Co., Youngstown, Ohio; Enameled Metals, Pittsburgh, Penn.; Kondu Mfg. Co. Ltd., Preston, Ont.

Facts from KANSAS

"'CSP' Transformers cut failures to zero"

"Until a few years ago, our system was equipped 100% with conventional transformers. A particularly hot rural line was giving us considerable trouble, so we decided to make a test installation of 'CSP' Transformers comprising 160 stations," says a Kansas Utility.

"Accurate records had been kept for two years prior to installation of the 'CSP' Transformers and were also kept for the two succeeding years. The records show that of the conventional transformers, 45 had been damaged by lightning, and required 491 service trips for re-fusing.

"Of the 'CSP' Transformers, not one was damaged. Only 39 instances occurred where secondary breakers opened to protect the transformers from short-circuits or overloads. This record gave us good reason to adopt the 'CSP' Transformer for all future construction and replacement."

Installation and maintenance costs for Westinghouse "CSP" (Completely Self-Protecting) Transformers are always lower, because complete protective equipment is built in, not separately mounted. A two-year survey of Electric Light and Power Companies shows the following: J-70590

NATIONAL AVERAGES

	"CSP"	Conventional
Installation Costs	$13.87	$24.74
Burn-out Rate	0.257%	1.005%
Fuse Outages	None	5.64% @ $6.52 per outage
Load Checks	Automatic	12.8%
Breaker Reset	1.02%	None

If you'd like to check your own costs against these national averages, ask your Westinghouse representative for Booklet 4-247-B, "Transformer Costs and Their Relation to Profits", Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

"CSP" devices . . . originated and patented by Westinghouse.

YOU CAN BE SURE... IF IT'S

Westinghouse

"CSP" DISTRIBUTION TRANSFORMERS

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

Demand proof OF PERFORMANCE

for Superior Insulator Quality

● All insulators are not alike. And Thomas believes that "Repeat Orders" are the best proof of superior insulator quality.

On this page are shown two recent installations of Thomas Insulators by one of the largest Utilities in the Country. For over 35 years, this Customer has given us order after order. Such *repeat orders* from this and other companies, are the best testimonials to the long life and outstanding performance of Thomas Insulators.

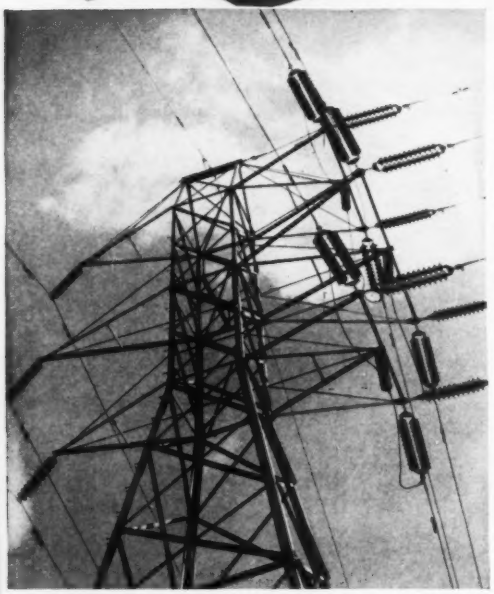
After all is said . . . it's still quality that counts plus proper designing, precision manufacturing . . . and PROOF OF PERFORMANCE. Throughout the world, Thomas Insulators have been establishing service records since the advent of the Electrical Industry. Why gamble?

★ ★ ★

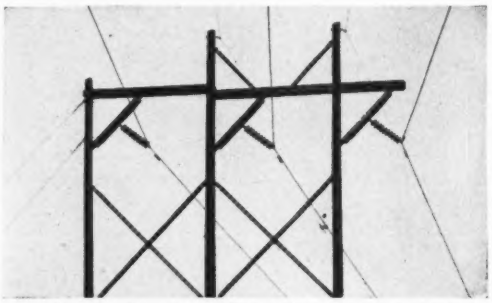
The R. Thomas and Sons Company is a manufacturer and designer of all types of porcelain insulators . . . pin-type, switch, suspension, spools, guy-strain, bushings and special high-voltage porcelain. In addition, Thomas supplies associated line hardware, clamps, fittings, preformed armor rods, and so on.

SPECIFY THOMAS INSULATORS—THE BEST BY LINE TEST

— Since 1873 —



5000 Thomas Insulators make certain that this new 132-kv, 14-mile line will give satisfactory service for decades to come.



Angle tower of new 132-kv Eastern line. Thomas Insulators installed on this line have the rugged stamina that assures long life and trouble-free performance.

The R. Thomas and Sons Co.

LISBON, OHIO

NEW YORK CHICAGO

1873 THOMAS INSULATORS our 78th year RELIABILITY 1951

Sales Representatives: E. B. Anderson Co., *Detroit* • Paul Berry, *Oklahoma City* • Ken H. Best, *Seattle* • Butler & Land, *Dallas* • R. E. Cunningham & Son, *Los Angeles* • Electric Supply Co., *Albuquerque* • Engineer Sales Corp., *St. Petersburg* • R. F. Hamilton & Associates, *Denver* • R. H. Harper, *St. Louis* • Geo. E. Henn Company, *San Francisco* • W. J. Hugo, *Minneapolis* • Leiser & Company, *Philadelphia* • Lynn Elliott Company, *Houston* • W. C. Milburn, *Chattanooga* • John G. Pattijohn Company, *Knoxville* • H. E. Ransford Co., *Pittsburgh* • Redmond Supply Co., *Phoenix* • J. F. Schaefer & Co., *Kansas City* • R. J. Sullivan & Company, *Boston* • Walter E. Thompson, *Birmingham* • E. E. Torkell, *Memphis* • Triangle Electric Supply Company, *El Paso* • United Electric Supply Co., *Salt Lake City* • Joe Williams, *Little Rock* • *Representatives in other principal cities*

A user REPORTS...

After their satisfactory experience with the 500,000 C. M. insulated aluminum cable (at right), National Supply Co., Torrance, Cal., says, "We will seriously consider aluminum when similar installations are planned." These cables, insulated with RH 600 v. U. S. Paracore, are connected to bus, from which they carry current to distribution panels for such heavy loads as welding machines, shears, rolls and other equipment.

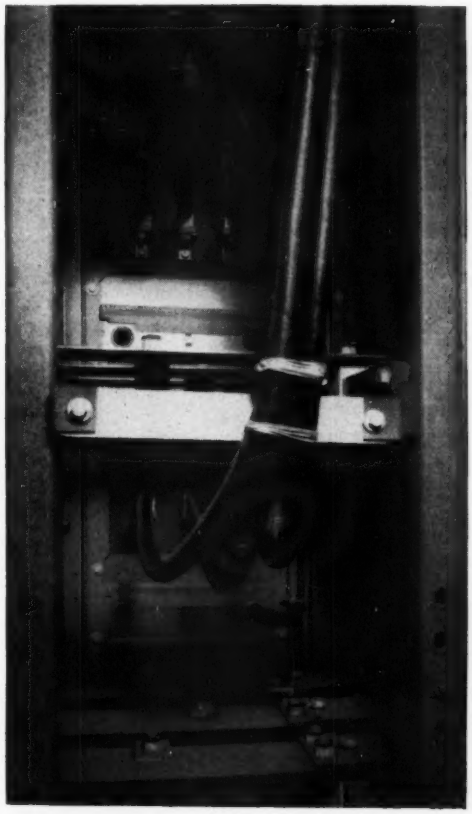


figure it in ALUMINUM and you figure it low

When you plan new production lines, add feeders for heavier loads, get prices both ways—in aluminum and in copper. You'll find you can make worth-while savings with aluminum . . . and installation is faster, easier because of aluminum's light weight.

Although the rearmament program restricts the use of aluminum, we are ready to help you with the planning for trouble-free, low-cost wiring.

FREE INSTALLATION BOOK

"Questions and Answers" on installation of aluminum conductors. Write for it now — ALUMINUM COMPANY OF AMERICA, 1777L Gulf Bldg., Pittsburgh 19, Penna.

Aluminum Conductors

ALCOA

of ALCOA EC ALUMINUM are made by leading manufacturers

A new 500-kva, General Electric network unit is lowered into its vault on North Pennsylvania Street, Indianapolis by an Indianapolis Power & Light Company crew.

Load grows in Indianapolis

...and a new G-E Network Unit goes in

It's as simple as that with a secondary network. There is little rearrangement of secondaries or service entrances with this modern distribution system.

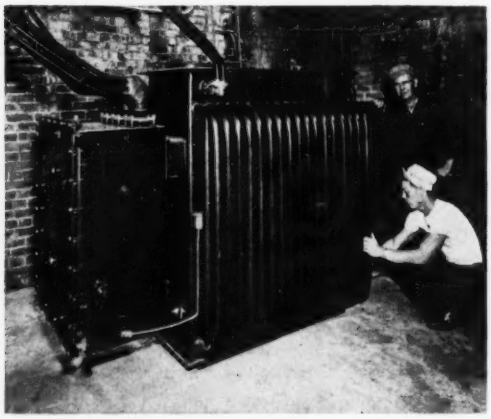
Better continuity of service is one big advantage of a secondary network. But, equally important to the utility is the elimination of headaches—and saving of rearrangement costs—as loads grow. Once a network system is installed, load growth can be taken care of by adding network units—*with seldom any other change or rearrangement required.*

This has been demonstrated in every city having such a system. Take Indianapolis, for example: Load increased greatly in the area around the post office on North Pennsylvania Street—modernization of stores, a new bank, and in general a healthy expansion of this business section.

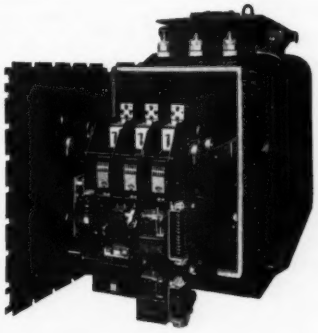
To serve this new load, the Indianapolis Power & Light Co. built a new vault and installed one 500-kva General Electric network unit.

The high-voltage feeder was already in the area—operating at 13,200 volts, it had plenty of capacity for the new load. The secondary was already in place . . . and with an established network system, the new unit was connected to this feeder and tapped in to reinforce the existing secondary grid. No redistribution of load was required, no rearrangement of service drops from one bank to another.

In every respect, with a network system, each added transformer represents an orderly step in system growth that was all provided for when the network was first engineered. For more information write for GEA-5024 and GEA-2017, *General Electric Company, Schenectady 5, New York.*



IN PLACE IN THE VAULT. This is the same unit shown on the opposite page after it was placed in the vault, and after cable connections were made. To the left is the throat-mounted General Electric network protector; at the right is the three-position disconnecting and grounding switch on the high-voltage side of the transformer.

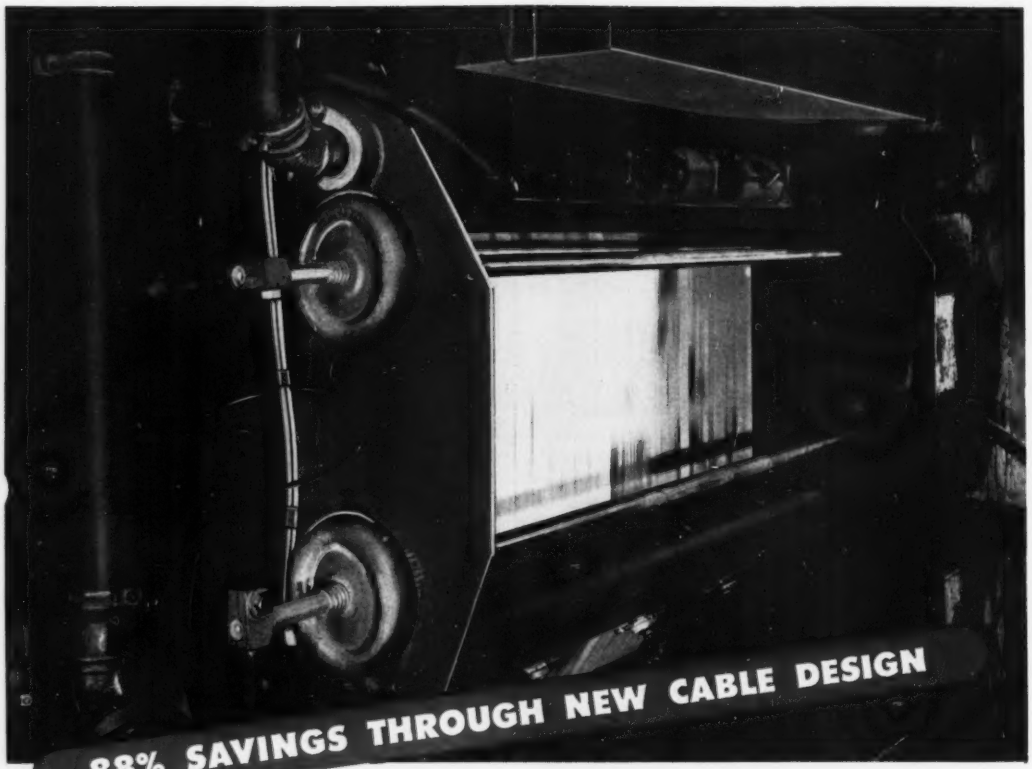


G-E NETWORK PROTECTORS ARE EASY TO INSPECT . . . EASY TO MAINTAIN. Automatic system protection on a network transformer is provided by the network protector which trips on reversal of power. When conditions are corrected, it recloses automatically. Protector case is submersible. With the door open, the protector unit can be slid out on rails for ready inspection. Dust-tight relays are of the plug-in type—can be easily removed for checking and replaced with spares.

GENERAL ELECTRIC

402-112

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.



How Okonite-engineered cables save money for the McCall Corporation

Engineers of the McCall Corporation, Dayton, Ohio, sought a means of reducing their insulated cable replacements on six printing presses. The ordinary cables used for supplying the gas ignition apparatus failed quickly because of temperatures ranging from 350 to 450°F. Monthly replacements of the standard rubber-insulated automotive ignition cable previously used gave rise to the following costs:

BEFORE

Cost of cable per year	**$650.00**
Labor in replacement	**900.00**
Yearly cost: materials and labor	**$1550.00**

In 1948, at the suggestion of an Okonite engineer, McCall installed Okonite's heat-resistant Okotherm cable. Since then, no replacements have been made under conditions of normal usage. Although the Okotherm cable was several times as expensive, experience has already shown that annual costs have been reduced to a mere fraction of the previous cost, as follows:

NOW

Cost of cable per year	**$142.00**
Labor on installation	**37.50**
Total yearly cost using Okotherm	**$179.50**

...a saving of 88.5%

● ● ●

Stories like this are not unusual in the file of actual case histories at Okonite. For the broad research and design and manufacturing skills which have developed such long-lived, trouble-free cables for normal use, have also developed many types for highly specialized applications.

These facilities are available to *you*, to help solve any difficult cable problems arising in *your* operation. Don't hesitate to call in your nearest Okonite representative, or write The Okonite Company, Passaic, N. J.

OKONITE SINCE 1878

THE BEST CABLE IS YOUR BEST POLICY

insulated wires and cables

9188

Switchgear and 15-kv air-blast switchgear for four 5000-kw generators at Petenwell.

Protects 177,000,000 kwh

Ruptair magnetic air circuit breakers are used in 4.16-kv switchgear for five 3000-kw generators at Castle Rock.

PROTECTION of both the generation and transmission of an estimated 177,000,000 kwh a year. That's the job recently taken on by Allis-Chalmers switchgear at the new Petenwell and Castle Rock hydroelectric plants on the Wisconsin river.

Each plant has an Allis-Chalmers duplex control board for convenient centralized control of the generators, low-voltage switchgear for station service, and high-voltage switchgear for fully protected power transmission.

These installations show how readily factory-built switchgear can be fitted into a specific installation — both electrically and architecturally.

Your nearby Allis-Chalmers representative can supply you with construction details. And he is always ready to provide experienced engineering assistance to help you fill your switchgear requirements. Allis-Chalmers, Milwaukee 1, Wisconsin.

A-3503

Ruptair is an Allis-Chalmers trademark.

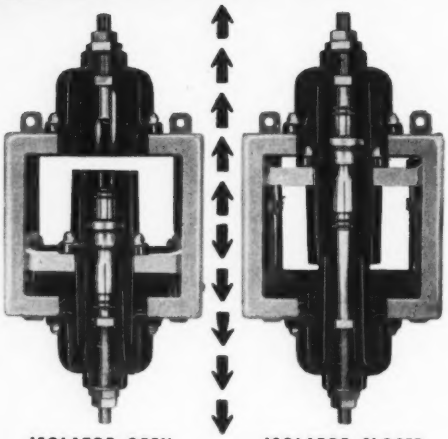
ALLIS-CHALMERS

It's The STRAIGHT LINE MOTION That Makes The Difference

All high voltage disconnects, including the ISOLATOR, have insulators, an upper and lower contact, and a movable member.

What is it then, that gives the ISOLATOR its superiority?

The answer can be given in four words.



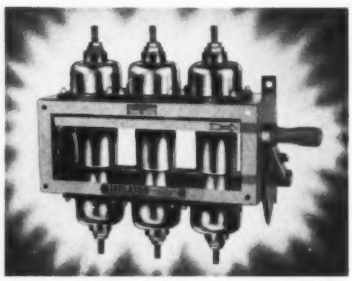
ISOLATOR OPEN ISOLATOR CLOSED

It's STRAIGHT LINE MOTION!

The straight line motion of the ISOLATOR permits the insulator units to take the form of bushings. The middle bushings telescope inside the upper and lower ones effectively shielding live parts. Furthermore the stud terminals in the upper and lower bushings are arranged for easy taping. Consequently, the ISOLATOR provides protection against accidental shock.

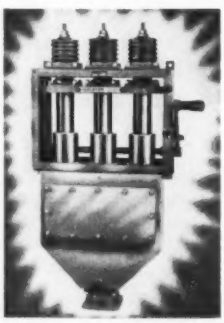
The straight line motion working in conjunction with the telescoping action of bushings save space because the overall dimensions of the ISOLATOR remain constant in both its open and closed positions.

The insulator bushings also act as barriers between phases eliminating the necessity for using the customary flash barriers.



Cat. ST-603-3 3.P.S.T.200 ampere 5000 volt ISOLATOR

Cat. ST-106-7 3.P.S.T. 600 ampere 7500 volt ISOLATOR



Cat. SC-102-55 3. P.S.T. 400 ampere 15kv CABLE ISOLATOR

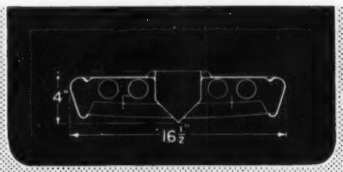
Combined with a Cable End Bell body the ISOLATOR becomes a Cable ISOLATOR. This constitutes a disconnect and a Cable End Bell in one compact piece of equipment, saving space, materials and installation labor.

Ask For Bulletin 140

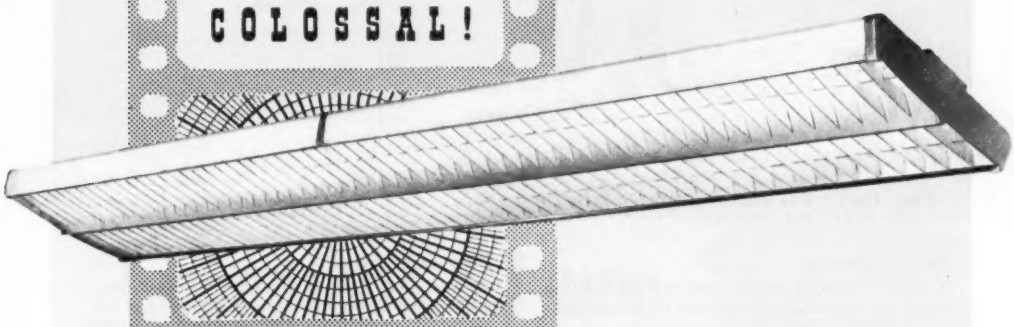
THREE ELECTRICAL ENGINEERS EQUIPMENT CO. MELROSE PARK, ILL. U.S.A. THE MARK OF QUALITY

ELECTRICAL ENGINEERS EQUIPMENT CO.

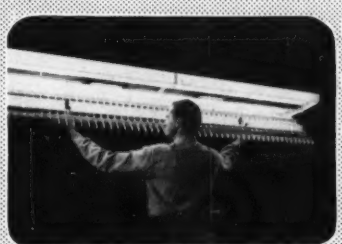
MELROSE PARK, ILLINOIS



TERRIFIC!
STUPENDOUS!
COLOSSAL!



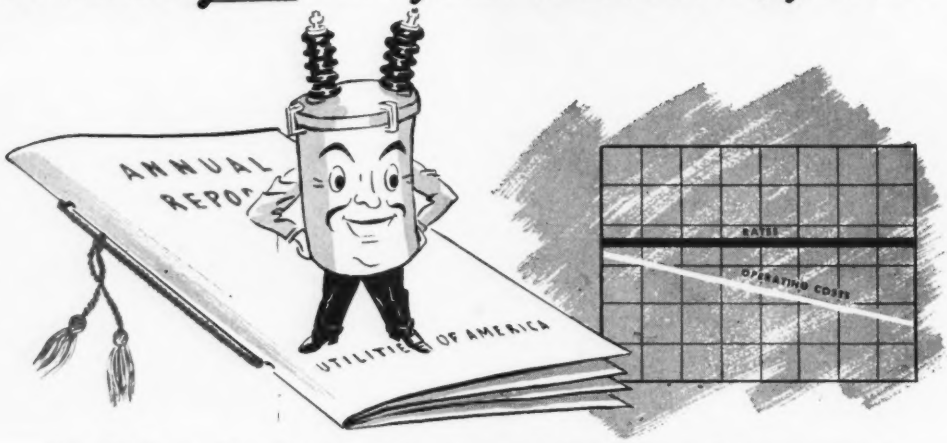
descriptive redundancy . . . we'd rather describe this new Sunbeam (#L1280) series in terms that can be supported by extensive photometric and installation experience. Designed for low brightness (.6c/sq." within the shielded zone) and high efficiency (82%) this series is available in all lamp lengths and milliamp ratings . . . write for literature.



SUNBEAM LIGHTING COMPANY •
777 EAST 14TH PLACE •
LOS ANGELES CALIFORNIA

MOLONEY *HiperCore* TRANSFORMERS

will look good on your Annual Report!



Yes, that's so. HiperCore Transformers can reduce your maintenance costs!

For instance

1. Peak overloads which produce high winding temperatures and greatly shorten the life of ordinary transformers are readily handled by HiperCore Transformers without damage. This is a direct result of the wound core design which permits a smaller core and coil mass, and therefore a lower temperature gradient.

2. Short circuits which cause shifting and distortion of transformer windings seriously damage winding insulation. HiperCore coils are securely braced and made mechanically rigid with heat-curing bonding materials to withstand short circuit conditions which would send most transformers to the repair shop.

3. Poor voltage regulation during short-time overload periods results from high transformer impedance. Low impedance has been achieved on HiperCore Transformers by means of the small core size and the resulting shorter coil winding. This means that HiperCore Transformers can often deliver the load with satisfactory voltage regulation where an ordinary transformer of the same Kva size might give such poor regulation as to require its removal and a larger size installed.

MES1-18

You can have

Conventional Type LL HiperCore Transformers equipped with side-wall-mounted high and low voltage bushings in all standard voltages below 5,000 volts.

Conventional Type CL-1 HiperCore Transformers equipped with one cover mounted high voltage bushing for use on grounded neutral systems.

Conventional Type CL-2 HiperCore Transformers with two cover mounted bushings in standard sizes for use on either Delta or Wye systems, in single or three-phase banks.

Or HiperCore CSP Transformers in identical ratings but fully equipped with self-protecting equipment with no additional protective equipment needed.

MOLONEY ELECTRIC COMPANY

Manufacturers of Power Transformers • Distribution Transformers • Load Ratio Control Transformers • Step Voltage Regulators • Unit Substations

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT ST. LOUIS, MO. AND TORONTO, ONT., CANADA

Clamptops let you USE good radio-proof design

Shape of the porcelain and physical qualities of a pintype insulator have little influence on radio interference unless tie wires permit the difference to show. Poor electrical contact of the tie on either the conductor or insulator head can largely cancel radio-proof design.

You can fully utilize this design, however, when the insulator is equipped with the O-B Clamptop. A bolted connection provides permanently tight head contact and develops the inherent radio silence built into the insulator.

Two simple nuts on a clamping piece replace the time-consuming and troublesome hand serve, and produce strength of anchorage that cannot be duplicated by older serving methods. This remains at permanent full efficiency in spite of forces that would loosen the ordinary tie wire attachment.

If you want to use the good radio characteristics of modern pintype insulator, specify these units with O-B Clamptop heads.

Ohio Brass

MANSFIELD • OHIO

4113-M

LONG JOHN* puts plenty of space between aerial cable and pole....

effectively preventing chafing of cable on outside corners

"LONG JOHN" is for outside corners only, so you won't need him as often as our other Aerial Cable Clamps, but you only need one outside corner to learn how useful he can be, particularly when straight lay cable is used.

MIF Aerial Cable Clamps offer *maximum flexibility*. A wide range of spacing is available, as detailed in the specification table below.

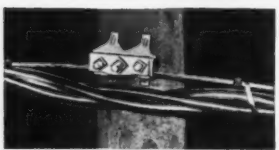
MIF Aerial Cable Clamps permit placing the messenger above or below the through bolt to comply with your practice or to meet special conditions.

MIF Aerial Cable Clamps simplify corner installations as the belled ends of the messenger grooves permit turns of from 30° to 90°, depending on the clamp.

MIF Aerial Cable Clamps have a pole-conforming base (the feet are tangential to average pole diameter). Large pads and spurs transfer the load to the pole in such a way as to minimize overturning and slotting down. The relation of the Clamping Plate to the Body Member is carefully worked out so that the load is supported by the Body and wedging of the messenger is avoided.

MIF Aerial Cable Clamps *combine in one device* a Clamp, Support, Spacer, and Pole Plate.

PA 192A—Messenger above through bolt. Note clearance from pole and belled ends of messenger groove.



PA 192A—Messenger below through bolt. To place messenger above through bolt clamp is reversed.

PA 198—Body member is tapped to assure maintenance of constant relation between Body member and Clamping Plate.

PA 198—Messenger below through bolt. To place messenger above only Clamping Plate is reversed.

SPECIFICATIONS

	HEAVY DUTY CLAMPS			SINGLE BOLT LIGHT DUTY CLAMPS	
	PA 192A	PA 178	PA 193	PA 197	PA 198
Messenger diameter, range	5/16"—½"	⅜"—⅝"	5/16"—½"	#6 A.W.G.—½"	#6 A.W.G.—½"
Clearance—face of pole to center of messenger	2¼"	2½"	6"	1½"	2"
Maximum size of through bolt accommodated	⅝"	⅞"	⅝"	⅝"	⅝"
Clamping bolts (2 of each)	½" x 2"	⅝" x 2"	½" x 2"	Through bolt serves as Clamping Bolt	
Maximum recommended load (vertical)	2500 lbs.	4000 lbs.	——	1800 lbs.	1800 lbs.
Shipping weight per 100 pieces	290 lbs.	520 lbs.	575 lbs.	90 lbs.	105 lbs.

PATENTS APPLIED FOR

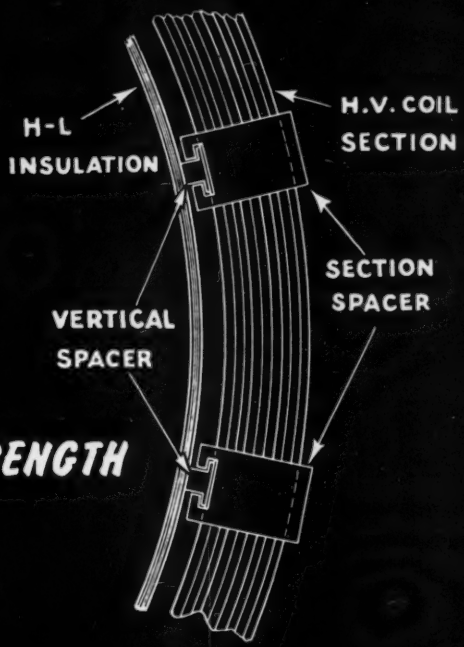
MALLEABLE IRON FITTINGS CO.

Pole Hardware Div., Branford, Conn.
N. Y. Office, 30 Church St.

Representatives: William J. Cottrell Company, Portland, Ore. • James H. Drew Corp., Indianapolis, Ind. • Industrial Engineering & Equipment Corp., Los Angeles, Cal. • JSG Electric Company, Chicago, Illinois • E. A. Thornwell, Inc., Atlanta, Georgia • J. P. Voight, Summerville, S. C. • Waltham, De Witt & Krusi, San Francisco, Calif. • L. R. Ward Company, Dallas, Texas • L. G. Wendegatz, Kansas City, Mo. • Williams Sales Agency, Fort Myers, Fla. • Williamson Sales Company, Shreveport, La. • O. C. Witte Company, Detroit, Mich.
Line & Cable Accessories, Ltd., Toronto, Canada

IT'S A FACT:

KUHLMAN LOCK SPACERS ASSURE GREATLY INCREASED COIL CONSTRUCTION STRENGTH FOR POWER TRANSFORMERS!



The Kuhlman lock spacer is a permanent connection between the section spacer and the high-low insulation barrier which supplies a firm, solid rigidity to the coil structure. No tape or other material of a temporary nature is used in the Kuhlman connection. Thus, there is no chance of coil sections in Kuhlman Power Transformers working loose from the expansions and contractions of operating temperatures.

A small item? Perhaps. But consider the consequences should coil sections work loose and come in contact with each other. That is a situation only costly repair time can correct. And it **can't** happen with Kuhlman Power Transformers—thanks to Kuhlman lock spacers.

It is close attention to small details like this which has kept Kuhlman among the leaders in the transformer industry for well over half a century. Keep it in mind the next time you buy power transformers. In the meantime, write for Kuhlman Bulletin CS-601, on Kuhlman power units.

Kuhlman ELECTRIC COMPANY, BAY CITY, MICHIGAN

EXPORT REPRESENTATIVES: *International Standard Electric Corporation,* 67 Broad Street, New York 4, N. Y. Cable Address, Microphone, N. Y.

A complete transformer line for ALL your needs. Write for new Kuhlman bulletins on Distribution, Power, Dry Type, Street Lighting and Specialty units.

KUHLMAN ELECTRIC K E

107

PREPARE FOR TODAY'S CHANGING DEMANDS WITH THESE

G-E WIRING FACTS!

1. WHERE DO YOU NORMALLY LOCATE GENERAL ELECTRIC REMOTE-CONTROL MASTER SELECTOR SWITCHES?

This new multi-purpose G-E master selector switch gives homeowners control of up to nine different lights or outlets from a single point. But do you know WHAT LOCATIONS ARE RECOMMENDED FOR MASTER CONTROL SWITCH INSTALLATIONS?

2. WHAT WIRE SHOULD YOU USE IN LOCATIONS EXPOSED TO GASOLINE?

Until now, this problem required the use of heavy, lead-sheathed cables. Today, General Electric's new lightweight, hydrocarbon-resistant wire helps you do the job efficiently and economically. WHAT SHOULD YOU SPECIFY?

3. WHAT IS THE BEST PROTECTION FOR MACHINE TOOL LEADS THAT ARE SUBJECT TO VIBRATION?

Rigid protection used for this purpose is often bulky and fails to provide the necessary "play." There is a simple solution. But, DO YOU KNOW WHAT'S BEST?

4. WHY DO AVA POWER CABLES PACK MORE CURRENT INTO EXISTING RACEWAYS?

More current per raceway is a big feature of G-E Deltabeston* AVA cables. Capable of operating at high temperatures because they are insulated with heat-beating asbestos and varnished cambric—they can be used at normal ambient temperatures to crowd more current into raceways. HOW DO THEY DO IT?

5. HOW DO YOU AVOID "ROCKING" WHEN YOU INSTALL A SWITCHBOX?

The new G-E Levelock switchbox solves the problem of rocking during installation—speeds rough wiring on any job. HOW?

Answers

1. ☐ The most popular locations for the master selector switch are in the master bedroom and at entrance doorways. But, customers can specify its installation in any convenient spot.
2. ☐ General Electric Geotrol Type TW wire is the full name of this new gasoline-and-oil resistant wire.
3. ☐ Use G-E flexible steel conduit to simplify vibration-proof installations in close quarters.
4. ☐ Deltabeston AVA cables can carry as much as 64% more current than ordinary cables with 60C rating, because two layers of asbestos insulation permit (1) higher operating temperatures and (2) more current per conductor.
5. ☐ The G-E Levelock switchbox has four leveling projections. It can't rock or tilt.

*Registered Trade-Mark of General Electric Company

FOR FURTHER INFORMATION

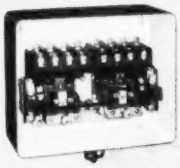
on any General Electric wiring materials, see your G-E Construction Materials distributor, or write to Section K54-1125, Construction Materials Division, General Electric Comany, Bridgeport 2, Conn.

GENERAL ELECTRIC

Your HANDY BUYING GUIDE

FOR SELECTING MOTOR CONTROLS

SOLENOID STARTERS



REVERSING SWITCHES

MANUAL STARTERS

TIMING RELAYS

RELAYS AND CONTACTORS

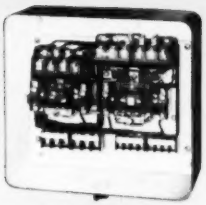
Have you one of these Handy Catalogs on your desk? If not, let us send you a copy.

This 92-page handbook on motor controls is written for the busy man who regularly specifies or buys manual or automatic starters, push buttons, limit switches, relays, timers, and other control components.

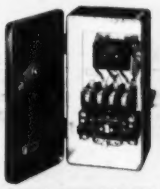
It is a valuable guide with dimensions, ratings, and prices, all arranged for quick and easy use. No matter what kind of control problem, whether manual or automatic, a.c. or d.c.—the Allen-Bradley Handy Catalog will help you.

The heart of the Allen-Bradley line is the time-tested A-B solenoid starter. It has maintenance free, double break, silver alloy contacts. Its simple one piece solenoid mechanism is trouble free. For quality control, specify Allen-Bradley.

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.



MULTISPEED STARTERS



COMBINATION STARTERS

AUTO TRANSFORMER STARTERS

STARTERS FOR SMALL MOTORS

PUSH BUTTONS • LIMIT SWITCHES • PILOT LIGHTS • FLOAT SWITCHES • ACCESSORIES

ALLEN-BRADLEY

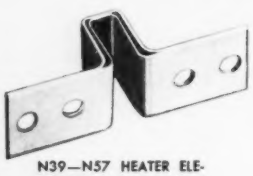
TROUBLE FREE MOTOR CONTROLS

QUALITY

851-M

BULLETIN 709 SOLENOID MOTOR STARTERS...

Check heater elements before mounting them in the overload relays.



N39—N57 HEATER ELEMENTS for motor full load currents 25 to 157 amp.

N17—N38 HEATER ELEMENTS for motor full load currents 2.68 to 22.9 amp.

NN4—N16 HEATER ELEMENTS for motor full load currents 0.19 to 2.41 amp.

FOR *Reliable* OVERLOAD PROTECTION

be sure to use the correct Heater Elements

Every Bulletin 709 solenoid starter has two reliable overload relays. The heater elements are supplied separately. Before installing a new starter, double check the heater elements—first, by noting their current rating as listed inside the starter cover;—second, compare this rating with the full load current rating of the motor. When these figures correspond with each other, you are assured of the most reliable overload protection. For complete safety for man, motor, and machine, always specify Bulletin 709 solenoid starters.

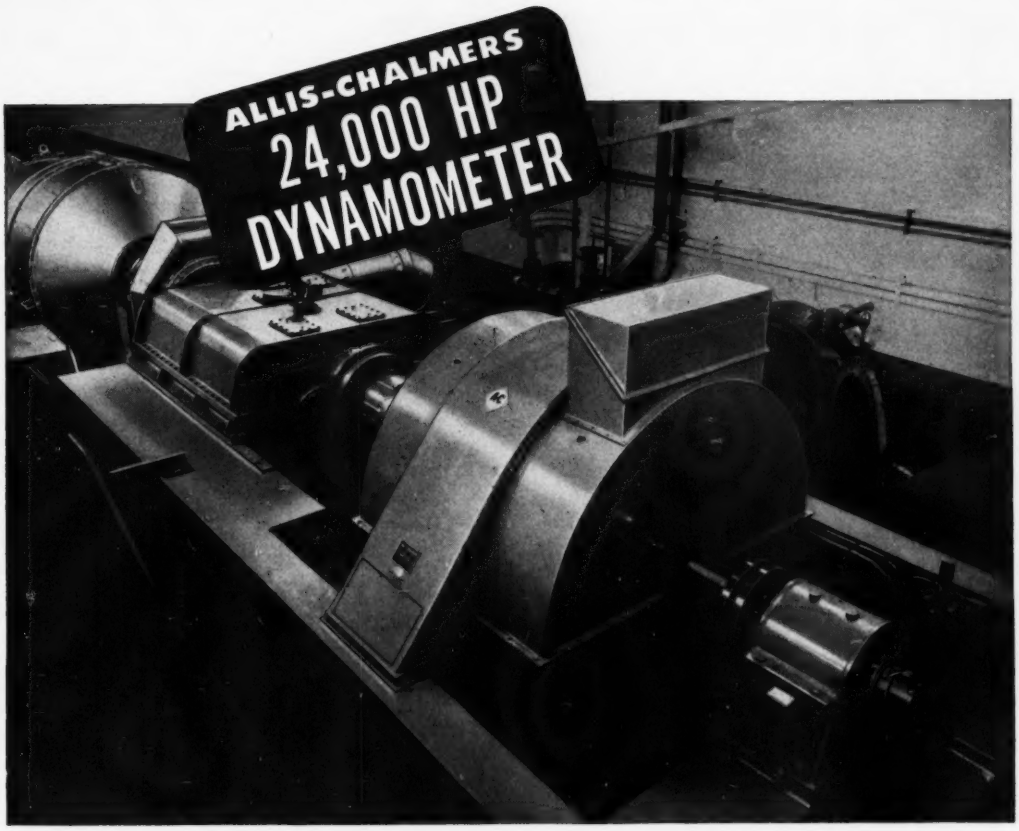
Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

851-M

ALLEN-BRADLEY

TROUBLE FREE MOTOR CONTROLS

QUALITY



Another Example of Allis-Chalmers Engineering

DESIGNING AND BUILDING this special power-delivering dynamometer required engineering skill available only to a company such as Allis-Chalmers with its century of engineering experience.

Arranged for direct measurement of torque, the dynamometer has an accuracy of ½% of the rated torque. Its overall speed range is 1210 to 15,072 rpm. And the 24,000 hp synchronous motor and its speed-increasing gear are supported by a special hydrostatically mounted base. Although the assembly weighs 130,000 pounds, it is so well balanced and cradled that it can be moved by the pressure of a man's finger.

The dynamometer was built for the Pratt & Whitney Aircraft Division of United Aircraft Corporation for testing turbo-jet engines. Allis-Chalmers also supplied the torque measuring equipment, metal-enclosed bus duct and switchgear.

Whether you need special or standard equipment—for power generation, distribution or utilization — you can benefit from this engineering experience by calling your nearby A-C representative. Allis-Chalmers, Milwaukee 1, Wis.

A-3501

ALLIS-CHALMERS A-C ALLIS-CHALMERS

Watthour Meters Save Critical Copper

The house type watthour meter has long been recognized as the most accurate measuring device in common use. Today, the shortages of critical materials such as copper and steel, which now confront all industry, emphasize other important values of this device.

The watthour meter conserves kilowatt-hours by reducing wasteful use of electricity. It therefore helps to control kilowatt demand, which is directly related to the capacity of distribution, transmission and generation equipment. Hence, the watthour meter helps to conserve critical materials, all along the line, particularly copper. Following are the results of two interesting studies:

Quick facts on meter savings

Many studies have been made to determine the difference in the use of power between metered and unmetered loads. Take a typical study. Data were obtained on two housing projects, which had 623 families, to whom power was supplied in bulk; that is, at a flat rate, unmetered. Data were also obtained on two similar projects, with a total of 213 families, whose power was individually metered. Major finding: Unmetered service increased the demand on the system by the minimum of 0.1 kw per customer.

One kilowatt equals 150 pounds of copper

*Another study was made recently to determine the copper required to increase capacity for supplying residential loads. The copper included that required for power generation, transmission, and distribution—most of it being for overhead lines. Most important fact: about 150 pounds of copper are required to increase capacity by 1.0 kw.

Meters save many times their weight in copper

The findings of these studies may be summed up this way: Unmetered residential service increases the demand on the system—in one typical case by at least 0.1 kw per customer. That additional demand can be related to system copper all the way back to the generator—and could amount to as much as 15 pounds (0.1 x 150).

Allowing for varying system loadings and design characteristics, it is quite evident that on a broad basis, watthour meters save many times the amount of copper they require; not to mention the savings in magnetic steel, iron, and even fuel, required by the equipment "back of the meter." General Electric, Schenectady 5, N. Y.

**Copper Requirements for Power Systems*, ELECTRICAL WORLD, September 10, 1951. By H. E. Campbell and W. L. Kelly.

GENERAL ELECTRIC

661-80

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

KEARNEY Fuse Links

HAVE BECOME

the Industry's Preference..

because they are . . .

- More Accurate for Truer Fusing
- Have Truer Operating Characteristics
- Designed in Four Speeds for Every Application
- and Are Packaged in Color Identifying Cartons

JAMES R. KEARNEY CORPORATION
4224-42 Clayton Ave., St. Louis 10, Missouri
Canadian Plant: Guelph, Ontario

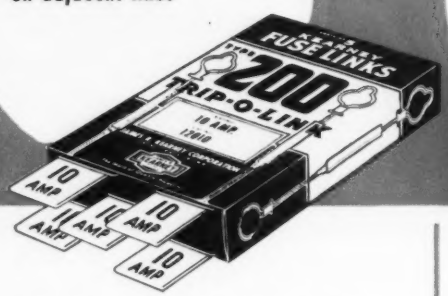
See following pages for more specific information about these popular Fuse Links.

Here They Are—

for EVERY APPLICATION...
COLOR IDENTIFIED to ELIMINATE
FUSE LINK CONFUSION

TYPE 200

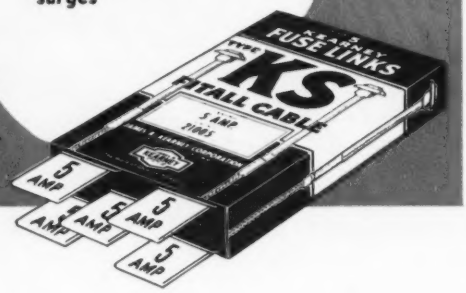
For prompt isolation of troublesome circuits — while maintaining service on adjacent lines



Certain circuits may prove to be more troublesome than others. When a line is subject to damaging long-time overloads and surges, continuity of service in adjacent circuits demands prompt action in isolating the troublesome line. This reliable protection is made possible by the accurate, durable characteristics of the pure tin used in the Type 200 Fuse Link. The low temperature operation of this link assures that overloads up to 150% of the fuse rating can be carried for one hour without damage to the fuse or fuse cutout.

TYPE KS

For reducing outages on circuits subject to switching and lightning surges



Where switching, motor-starting and lightning surges are common, maintain service by using the Type KS Fuse Link. Low temperature operation accommodates peak loads and dragging overloads with full protection to line equipment and without damage to the cutout. The overload capacities of the Type KS and Type 200 links are identical; however, the surge capacity of the Type KS fuse is twice that of the Type 200. In a thorough coordination plan, fuse links must coordinate not only with other fuses, but also with circuit breakers, and the slow speed characteristic of the KS link provides for the proper teamwork

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

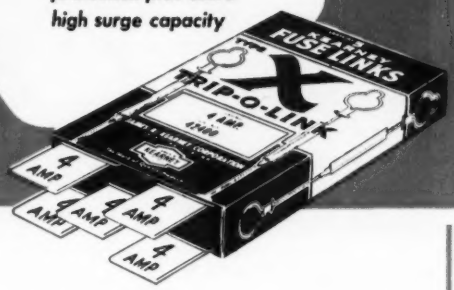
JAMES R. KEARNEY CORPORATION 4224-42 Clayton Ave., St. Louis 10, Mo.
Canadian Plant: Guelph, Ontario

SPECIFY KEARNEY PRODUCTS...

KEARNEY Fuse Links

TYPE X

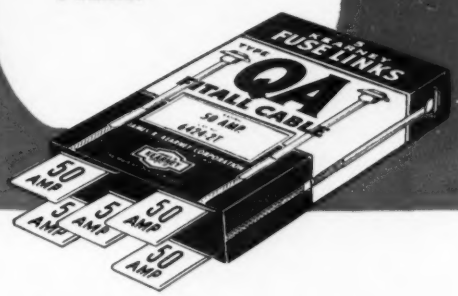
For distribution transformer overload protection plus extra high surge capacity



Designed to match the safe-loading curves of distribution transformers, the Type X Fuse Link keeps transformers in service during heavy overload periods and surges, and yet fuses in an instant when faults persist or reach damaging ranges. The extra high surge capacity means satisfied customers and lowered expense due to unnecessary outages. High tensile strength of Type X fuses prevents mechanical failure due to handling . . . a feature particularly important in fractional-ampere ratings. The Type X fuse is designed to carry full rated load continuously and to open 230% of rated current within 5 minutes.

TYPE QA

Designed to open 150% of rated load within 5 minutes



The QA link is designed to open at a lower percentage of rated current and therefore will fuse more rapidly than fuse links of the same ampere rating which have been designed to open 230% of rated load within 5 minutes. For working out coordination problems involving *all* Kearney Fuse Links, minimum melting and total clearing time-current curves on NEMA standard forms, together with fuse coordination charts, will be supplied upon request.

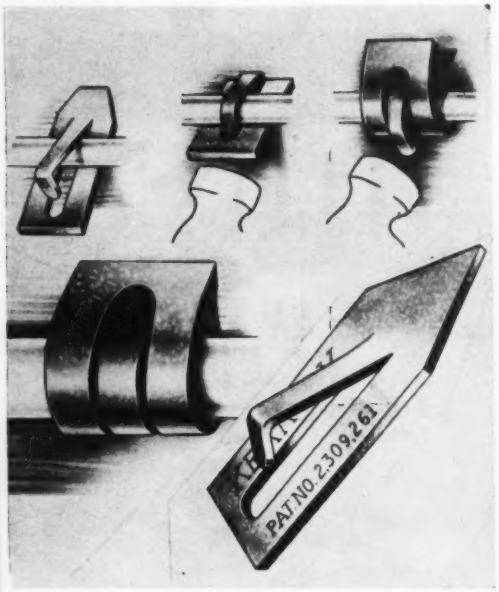
Keep the Right Link in the Right Place at the Right Time with a Kearney pole-mounted Fuse Link Dispenser.

West Coast Distributor:
MAYDWELL & HARTZELL, INC.

-172

Better Construction – SAFER Maintenance

PRODUCT NEWS



Clip

(1) James R. Kearney Corp., 4236 Clayton Ave., St. Louis 10, Mo.

A new type of clip for securing ground wires to poles on electric power lines is said to prevent radio interference by eliminating the spark gaps between clip and wire. The clip is designed so that its contact pressure with the wire is independent of its hold in the pole. It is claimed that the pressure remains constant even if years of exposure cause it to loosen in the wood.

The clip is first driven part way into the pole with a hammer and then the ground wire is slipped under a hook that projects from the body. A few more hammer blows finish the operation by causing the hook to grip the wire and the end of the clip to bend over and bite into the pole.

Details are in bulletin 16-12.

Motor and Cable Insulation

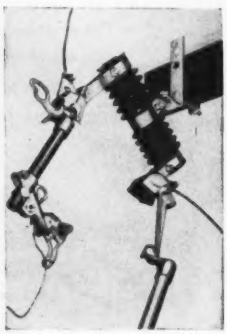
(2) General Electric Co., Pittsfield, Mass.

Silicone rubber-treated glass cloth for motor and cable insulation is in production in 36-in. widths from four to ten mils thick. In the dripping process used, glass cloth is passed through a liquid solution of silicone rubber. After application of heat to cure the rubber, the treated fabric is ready for use. According to the manufacturer, improvements in silicone rubber formulations during the past year will result in a superior product to that developed several years ago.

Dust-Tight Fixtures

(3) Russell & Stoll Co. Inc., 125 Barclay St., New York 7, N. Y.

A new line of type DL dust-tight lighting fixtures is designed for hazardous locations, Class II, groups E, F, G, and Class III. Operation far below allowable temperatures for this class of installation is claimed. Lampholders are located within conduit box assembly of both pendant and junction box types, allowing installation and wiring without regard to size or style of fixture. Pendant and junction box bases are standard to all fixtures, and accommodate any style fixture-globe-reflector assembly in either 100 w or 200 w sizes, giving complete interchangeability. Data sheet 7151-10 gives details.



Fuse Cutout

(4) A. B. Chance Co., Centralia, Mo.

A new type fuse cutout may be used to break charging, magnetizing and load currents. Called the KO-L, it has a load break lever that is pulled with a disconnect stick or similar tool to interrupt the circuit inside the cutout fuse tube. This lever operation breaks the fuse link causing the cutout to open in the same manner as when the fuse is blown by an overload or fault.

When blown by overload or fault current, this new cutout opens by kicking out at the bottom. This action permits a mechanical time-delayed separation of contacts. Link ejection is completed and arc extinguished in the tube before the contacts part. This prevents pitting and burning of contacts, eliminates contact maintenance and reduces radio and television interference.

According to the manufacturer, tests have shown the cutout to give over-all protection from light overloads to heavy fault currents. The load break device is optional.

For Additional Information Fill in the Coupon on Page 64

Ready at the Flip of a Switch!

LOW-COST POWER FOR RURAL AMERICA

CARRIED BY

Copperweld-copper TRADE MARK

CONDUCTORS

Today, on millions of farms, low-cost power is helping the farmer to greatly increase his productive capacity—basic to our nation's strength and welfare. In addition, electricity is making life in the farm home as comfortable and pleasant as anywhere in the city. We salute the vision and courage of the men and organizations who have brought about this transformation in the life of Rural America. And we are proud of the important part Copperweld*-copper Conductors are playing in rural electrification.

Hundreds of thousands of miles of these rugged Copperweld-copper Conductors have proved their ability to stand up under all types of operating conditions and deliver dependable and economical service year after year. They are the only conductors that combine tremendous strength for long spans—vibration-reducing triangular design—and completely non-rusting construction. Always specify Copperweld-copper for your rural lines. You'll find it pays in longer life, less maintenance, and lowest annual cost.

*Trade Mark

COPPERWELD STEEL COMPANY, Glassport, Pa.

Pacific Coast Office: Monadnock Building, San Francisco

Copperweld-copper TRADE MARK

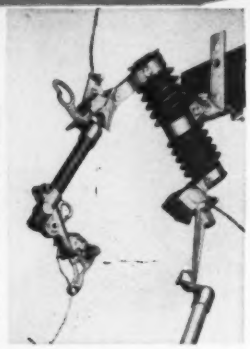
DEPENDABLE CONDUCTORS

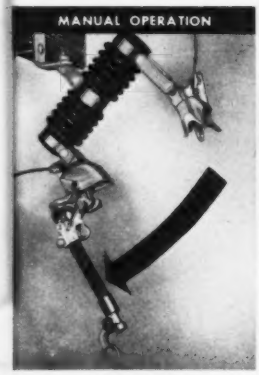
– Cost Less BECAUSE THEY Last Longer

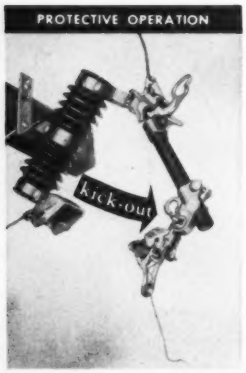
NOW...the combination you've asked for...

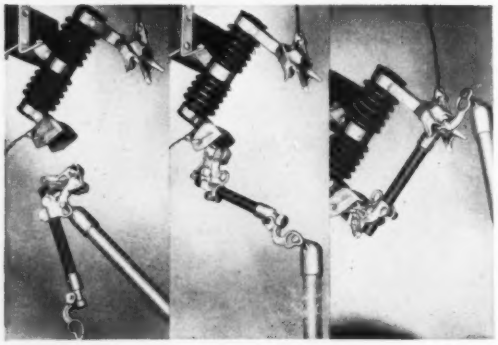
LOAD BREAK OPERATION *plus*

OVERALL PROTECTION...in the new CHANCE KO Cutout









C51-4

Breaks charging, magnetizing and load currents —manually

The new KO cutout is now available with a *load break* lever for interrupting line charging currents, capacitor bank circuits, loop or radial circuits and single or three phase transformer magnetizing or load currents without the aid of reclosers, circuit breakers or expensive load break equipment. By pulling the load break lever, the circuit is interrupted *inside* the fuse tube, in the same manner as when the fuse is blown by an overload or fault. Photo at left shows the simplicity of operation. The delayed Kick-Out prevents contact pitting.

Exclusive Kick-Out operation—gives you these advantages

The exclusive CHANCE "kick-out" operation gives a *positive* indication to trouble shooters that the cutout has been opened manually or by a protective operation, thus saving costly patrolling time. The Kick-Out method of operation has the advantage of mechanical time delayed separation of contacts not possible in gravity operated cutouts. Link ejection is completed and arc extinguished in tube before contacts part. This prevents pitting and burning of contacts, eliminates contact maintenance and reduces radio and television interference.

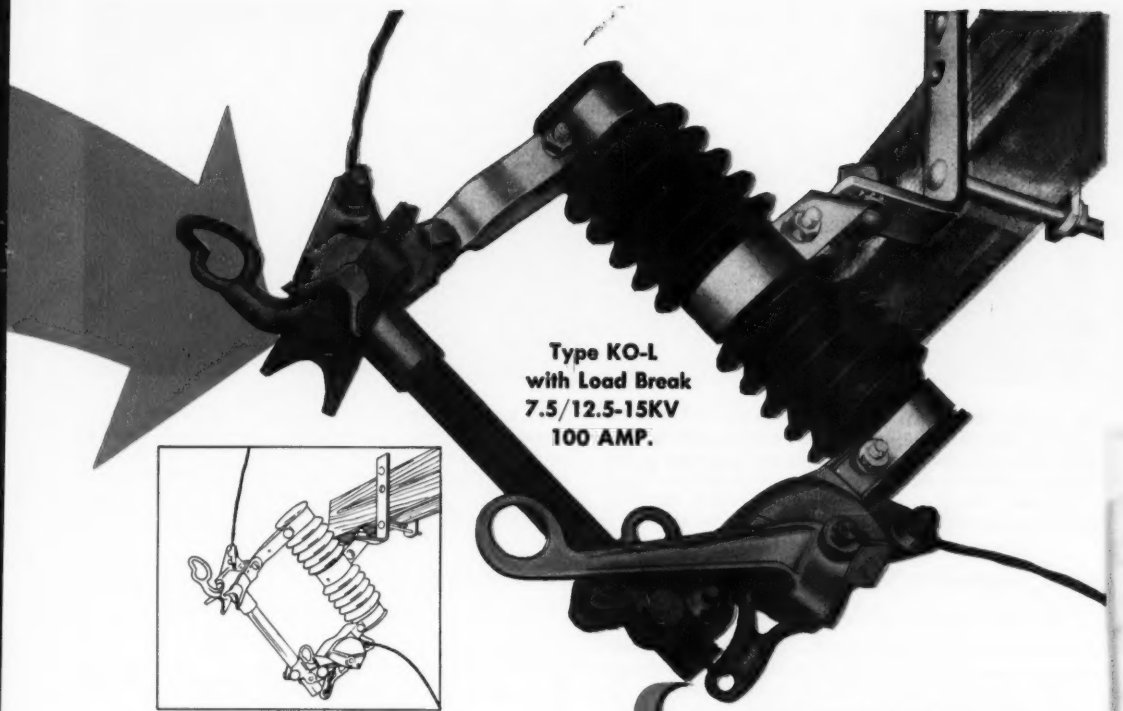
Easy to Re-Fuse with a Hook Stick

Chance KO Cutouts with or without the load break lever are easily reloaded. The tube is released by a pry-out lever. The KO design prevents any shock or strain on the fuse link when closing the cutout after re-fusing. This prevents damage or breakage of the link. Long guides aid the operator in closing the cutout from any angle. When the cutout is closed-in on a fault, expulsion gases are directed away from the operator.

Overall Protection from Light Overloads to Heavy Fault Currents

Thousands of successful field tests* prove superior performance from 1 amp to above 3500 RMS amps at power factors of less than 20%—your assurance of positive protection from light overloads to heavy fault currents.

*Tests made by Chance Mobile Lab on utility systems.



Type KO-L with Load Break 7.5/12.5-15KV 100 AMP.

Type KO (Conventional)
Same heavy construction as KO-L

Only CHANCE gives you all these features

... make your own comparison with any other cutout

Compare the Chance KO with any other cutout . . . compare it electrically—compare it mechanically—test it for high or low current operation . . . you'll find that these CHANCE features add up to economical, safe, always reliable operation.

Order through your electrical supplier—specify CHANCE—KO or KO-L.

1 ***LOAD BREAK*** **device, optional.**

2 ***Overall Protection*** **—Proved by thousands of tests.**

3 ***Pry-Out Lever*** **for easy opening and closing. Allows the use of heavy duty contact springs without requiring extra effort to remove tube.**

4 ***Exclusive Ejector Mechanism*** **provides fast complete ejection of fuse link before contacts part—even on a low current interruption.**

5 ***Sleet Shields for All-weather Operation.*** **Protect contacts and operating mechanism and prevent water from entering the tube to cause twisting and swelling of the fiber.**

6 ***Mechanical Time-Delayed Contact Separation.*** **Prevents pitting or burning of contacts.**

7 ***Pivot Bracket*** **(E.E.I.—NEMA) for cross-arm mounting. A special bracket is available for pole mounting.**

8 ***Positive Semaphore Indication*** **to show if cutout was opened manually or by a protective operation.**

9 ***Easy Reloading*** **—simple hook stick operation from any angle.**

10 ***Link Element Protection*** **—Link tension not affected by closing action. Eliminates breakage or damage to time-current characteristics of link.**

11 ***Overtravel Stops*** **—Protect pressure contact springs.**

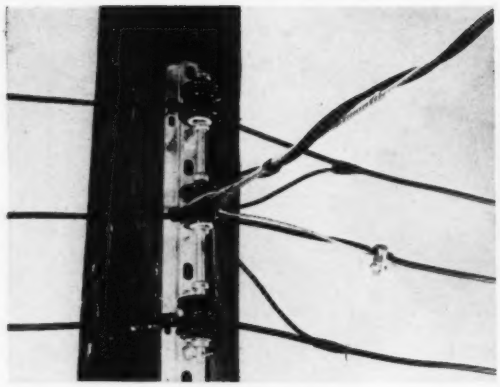
12 ***Safety to Operator*** **—Tube angle directs expulsion gases away from lineman when operating cutout.**

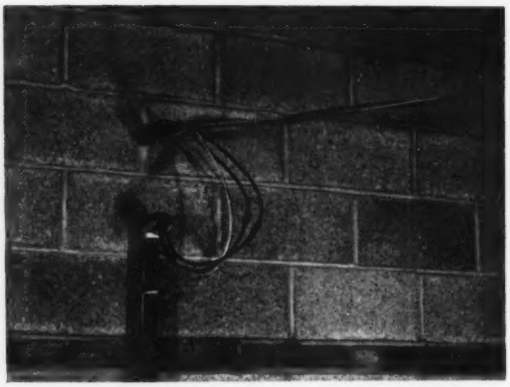
ABC INDUSTRIES

You know it's RIGHT when you specify CHANCE

A·B·CHANCE CO·

CENTRALIA, MISSOURI • SAN FRANCISCO, CALIFORNIA



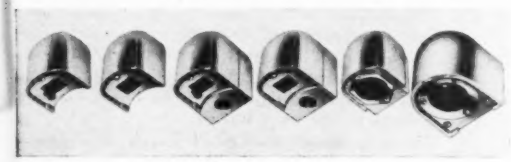


(5) **DEAD-ENDING ALUMINUM SERVICE ENTRANCE CABLE—This Preformed aluminum dead end was developed for aluminum service entrance cable of the type composed of two insulated aluminum wires stranded around a bare aluminum neutral wire. The dead end is applied to the bare aluminum neutral at both the house and the pole end of the cable by a simple hand operation, requiring no tools. It is made of a strong aluminum alloy wire. The strength of the assembly exceeds by more than two times the maximum expected loadings for this type of cable, the manufacturer states. Made by Preformed Line Products Co., 5349 St. Clair Ave., Cleveland 3, Ohio, in response to increasing popularity of this service entrance cable**

Small Synchronous Motor

(6) Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

A new small synchronous motor operates on the reluctance principle; has no brushes, slip rings, rotating coils or permanent magnet. It can be built to operate continuously at any voltage below 250 v, either single-phase or polyphase. A typical motor is 4 in. in diameter and 2⅜ in. long; weighs 2.6 lb and develops 8 oz-in. starting torque and 0.8 in. synchronous torque. Simplicity of construction gives high stock resistance and practically no maintenance, the manufacturer states. No starting equipment is required. The motor can start and pull into step at any frequency from 10 to 400 cycles.



Weatherproof Switch and Receptable

(7) Revere Electric Mfg. Co., 6009 Broadway, Chicago 40, Ill.

These units can be mounted on outdoor flat or curved surfaces. The flats are for walls, the curved units for pipes, poles, etc. They comprise a cast cover and surface plate on which the switch or receptacle is mounted. Mounting plate is arranged for drilling and tapping wiring outlet. The units come with receptacles for two wire, 15 amp, 125 v and 10 amp, 250 v. Three-wire Twistlock receptacles are provided for 15 amp, 125 v and 20 amp, 250 v, permitting use of portable electric tools, vacuum cleaners, etc.

Suggested applications are on construction projects, in farm yards, in back yards of homes, on shipping platforms, in factory yards.

Plastic Tubing

(8) Samuel Moore & Co., Mantua, Ohio

A plastic armored electrical metallic tubing for use in corrosive atmospheres is an addition to the Dekoron line. It is made by the manufacturer's patented extrusion process. A .020-in. coating of corrosion-resistant vinyl or polyethylene plastic is extruded over standard galvanized electrical metallic tubing. By varying the thickness and composition of the plastic armor, the conduit may be given any desired dielectric properties, the manufacturer states. It is claimed that Dekoron conduit is impervious to corrosive effects of moisture, salt air, acids, alkalies, oils and grease and is immune to normal temperature changes. Standard is black but colors can be supplied. If desired the plastic coating can be applied over standard rigid conduit instead of galvanized electrical tubing.

D-C Armature Winding-Insulation Tester

(9) General Electric Co., Special Products Division, Schenectady 5, N. Y.

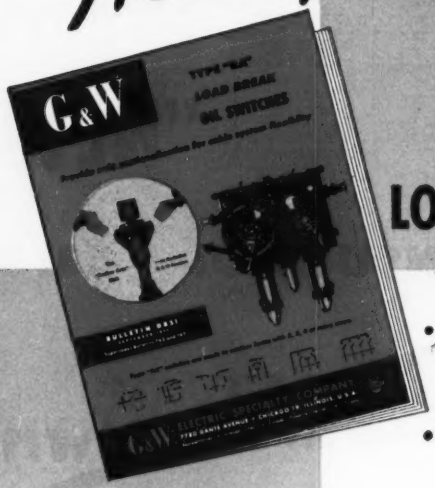
This new tester will detect and aid in locating faults in turn-to-turn, coil-to-coil and winding-to-ground insulation in d-c armatures of any size and rating. It is designed for testing large motors and generators such as those in railroad, marine and steel industries.

The tester consists of a repeating-type, surge-voltage generator that operates 60 times a second and a cathode-ray oscilloscope, all in one cabinet. A fixture is provided for applying test voltage to the commutator of the armature being tested.

The manufacturer claims that the tester can check an entire armature in from three to four minutes. As it is being inspected, the operator has only to glance at the oscilloscope screen to see if the surge wave shown is of proper shape and amplitude. Any variance from the correct wave indicates a fault in the tested armature.

The tester is 20 in. wide, 30 in. deep, 48 in. high; weighs about 800 lb. It operates on 230 v, 60 cycles and is 3-wire, single-phase fused for 30 amp.

Here's your New Catalog of G&W TYPE "RA" LOAD BREAK OIL SWITCHES



- • • With complete information and design details of many forms of these versatile sectionalizing devices.
- • • An important reference for all men concerned with primary distribution systems.

Since their introduction in 1928, Type "RA" load break switches have had a trouble-free operating record—in utility systems and in industrial plants—which fully justifies their use as load break disconnects for single and multiple circuits.

Included in Bulletin DB51 are listings of standard 400 ampere switches in 7,500 15,000 and 23,000 volt ratings—and 600 volt switches rated 400 and 1,000 amperes. 34,500 volt switches are also available.

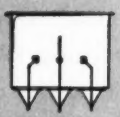
SEND FOR YOUR COPY OF NEW BULLETIN DB51 TODAY—

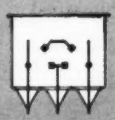
—and plan to obtain distribution system flexibility with G & W Type "RA" load break oil switches.

Here are a few of the many forms of "RA" switches widely used for rapid and convenient isolation and rerouting of cable circuits.

Type "RAD"
Single throw

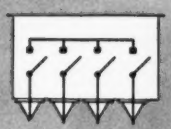
Type "RA"
Double throw





Type "RAL"
for tapping a looped-thru feeder

Type "RAM"
Multiple circuit load break oil switch



See your copy of new bulletin DB51 for the complete story—How "RA" switches are "custom built" from standard unit parts to perform simple or complex sectionalizing jobs.

G&W ELECTRIC SPECIALTY COMPANY
7780 Dante Avenue Chicago 19, Illinois

Please send G & W Bulletin DB51 to:

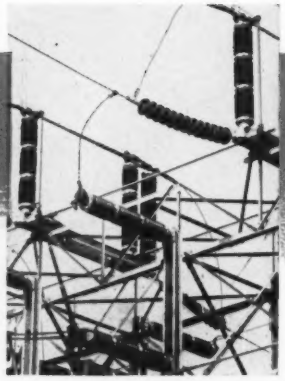
Name_____ Title_____

Company _____

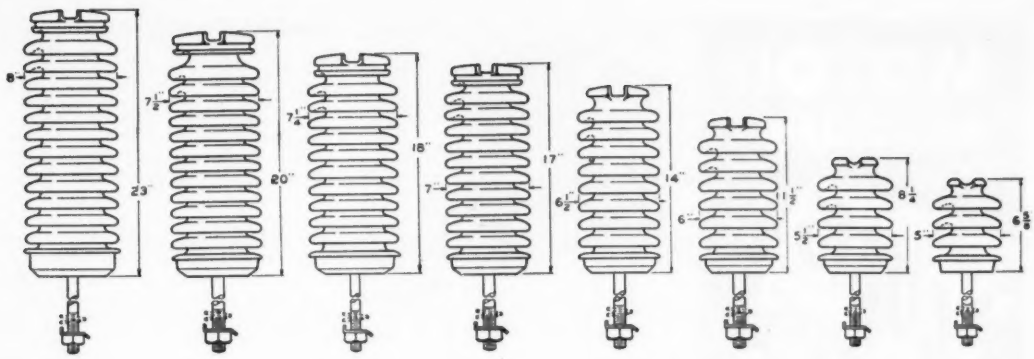
Address _____

City_____ State_____

THE "NEW" INSULATOR DESIGN WITH



The Lapp Station Post, incorporating the same design and performance characteristics as the Lapp Line Post, boasts an operating record unmatched by any other insulator for switch and bus support use.



9982 9978 | 9366 9466 | 13560 13561 | 9355 9455 | 9345 9445 | 9335 9435 | 9325 9425 | 9320 9420

THE 20-YEAR SERVICE RECORD

How much of the equipment on your system was designed 40 years or more ago? If you can think of any, would you rate it at "top efficiency" by 1951 standards? The design of most of your insulators is that old. There's been only one significant innovation in insulator design since before 1910. That innovation was the Lapp Line Post, and subsequent Station Post design. So this is the "new" design, the "different" insulator. And, we hasten to add, by the degree it's *different*, it's a better insulator. Twenty years ago we were promising . . . no radio interference . . . no puncture . . . no cracking . . . no cleaning . . . greater resistance to stones and bullets . . . better performance under arcover. And today, with a 20-year service record to back us up, we can add those things all up in saying "*Lines on Lapp Line Posts have fewer outages, require fewer insulator replacements and less maintenance than comparable lines on any other type of insulator.*"

Isn't it time *your* standards got to a 1951 basis? Specify Lapp Line Posts.

Lapp

LAPP INSULATOR CO., INC., LE ROY, N.Y.

MOTOR
MAINTENANCE
COSTS
MORE
NOW!
So——
Cut it to a Minimum
with OHIO Motor &
Generator Brushes!
OHIO BRUSHES are designed and made to withstand all reasonable demands made upon them and to insure proper commutation at all times. This means that OHIO brushes save you time, labor and money in the efficient operation of the motors in your plant. Outline your needs and contact us for the proper recommendations.
ORDER YOUR CARBON BRUSHES FROM A SINGLE SOURCE
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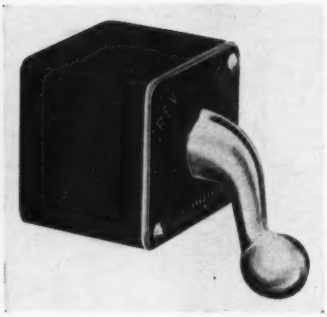


Reversing Drum Switch

(10) Allen-Bradley Co., Milwaukee, Wis.

Bulletin 350 style A reversing drum switch is designed for a wide variety of mounting arrangements for small workshops and industrial services. It is the equivalent of a 3-pole double-throw switch; is small and is simply designed for machines and equipment requiring an economical across-the-line starting and reversing switch for a-c and d-c motors rated 2-hp or less.

Housing is bakelite and contains eight fixed contacts, a moving contact assembly, handle-coverplate assembly and mounting screws. Contacts are cadmium silver alloy. Wide flexibility in mounting is claimed.

Typical applications include drilling machines, lathes, milling machines and laboratory equipment.

Transformers for MV Lamps

(11) Jefferson Electric Co., Bellwood, Ill.

A new series of transformers for indoor and outdoor operation of mercury vapor (H-1) lamps consists of single- and 2-lamp units, normal and high power factor, for 115- and 230-v circuits. The outdoor line includes aerial, pole top, pole base and vault types for boundary lighting, building exteriors, parking and shipping areas. The aerial type can be converted for pole-top installation with an adapter that will fit any pole top from 2 to 4½ in. in diameter.

(12) PLUG — Double spring-type blades are a feature of the new Waldron plug being offered to electrical cord set and equipment manufacturers by the Laminated Metals Products Corp., 9993 Broadstreet, Detroit 4, Mich. The blades are bowed out in both directions to insure connection regardless of where contact is located in the receptacle. The blades have been approved by Underwriters' for making connection using up to 15 amp at 120 v or 10 amp at 220 v.

Terminal Block Connectors

(13) Wama Co., Industrial Bldg., Baltimore 2, Md.

The manufacturer has developed a simplified solderless connector for its Add-A-Point terminal blocks. The new connectors will accommodate standard wire sizes from No. 14 to No. 6. The blocks are rated up to 60 amp and will operate safely up to 750 v. Each unit consists of a one-piece point and barrier, an end piece, marking strip and short screws. No through bolts, long screws or individual barriers are used.

Sample Card

(14) Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.

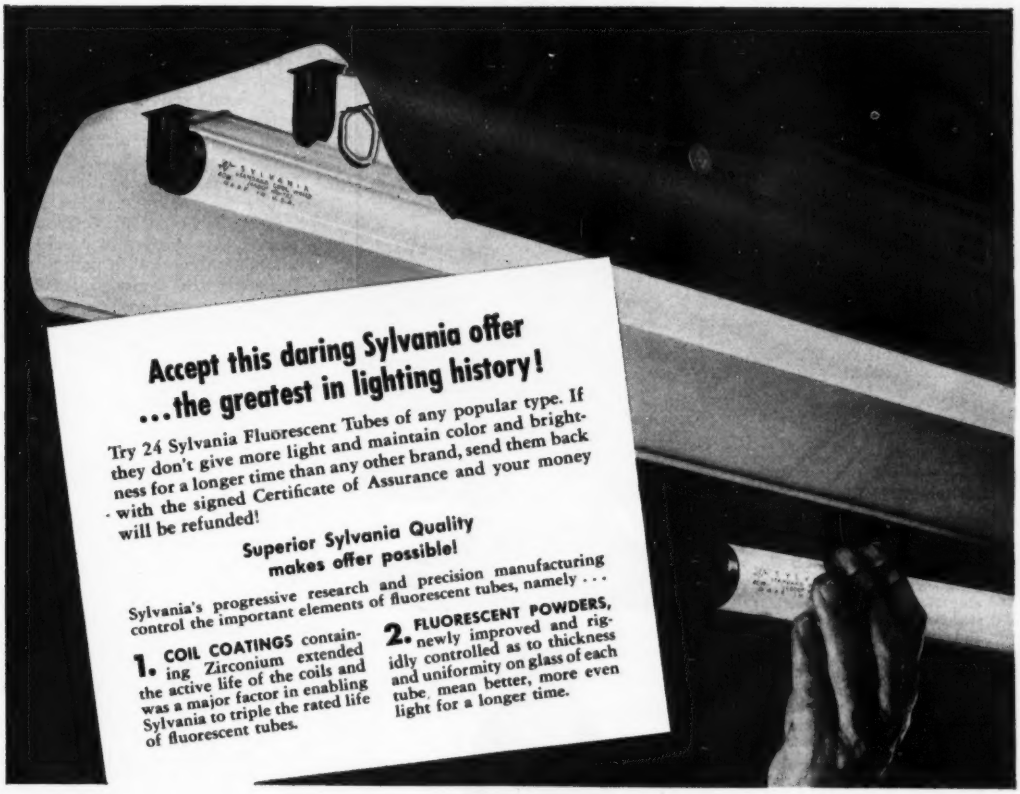
Tubing or sleeving size and type can be selected with the Dieflex gage. Leads or wires are slipped into the closest fitting hole on an aluminum gage to determine size. Seven samples of the different types, grades and colors are mounted on pressboard. The card describes the various tubing or sleeving types having rayon, cotton or glass base braids with oleoresinous varnish, vinyl resin or silicone varnish treatments. Technical data on sizes, colors, telescoping, dielectric strength and packaging also are included.

(15) SWITCHES—First of a series of small-size magnetic blowout switches for high-voltage d-c circuits are in production by Micro Switch, Freeport, Ill. These new designs of snap-action switches come in ratings of 115-v nonpolarized and 115- and 230-v polarized. Those available now are single pole, double throw.

(16) MOTOR STARTERS — Two new motor starters—type RAR (reversing) and RAS (multispeed)—have been added by Arrow-Hart & Hegeman Electric Co., 103 Hawthorn St., Hartford 6, Conn. They come in sizes 0, 1, 2, 3 and 4.

NOW PROVE IT!

Without risk, without loss . . . discover for yourself that Sylvania Fluorescent Tubes are First!



Accept this daring Sylvania offer . . . the greatest in lighting history!

Try 24 Sylvania Fluorescent Tubes of any popular type. If they don't give more light and maintain color and brightness for a longer time than any other brand, send them back with the signed Certificate of Assurance and your money will be refunded!

Superior Sylvania Quality makes offer possible!

Sylvania's progressive research and precision manufacturing control the important elements of fluorescent tubes, namely . . .

1. COIL COATINGS containing Zirconium extended the active life of the coils and was a major factor in enabling Sylvania to triple the rated life of fluorescent tubes.

2. FLUORESCENT POWDERS, newly improved and rigidly controlled as to thickness and uniformity on glass of each tube, mean better, more even light for a longer time.

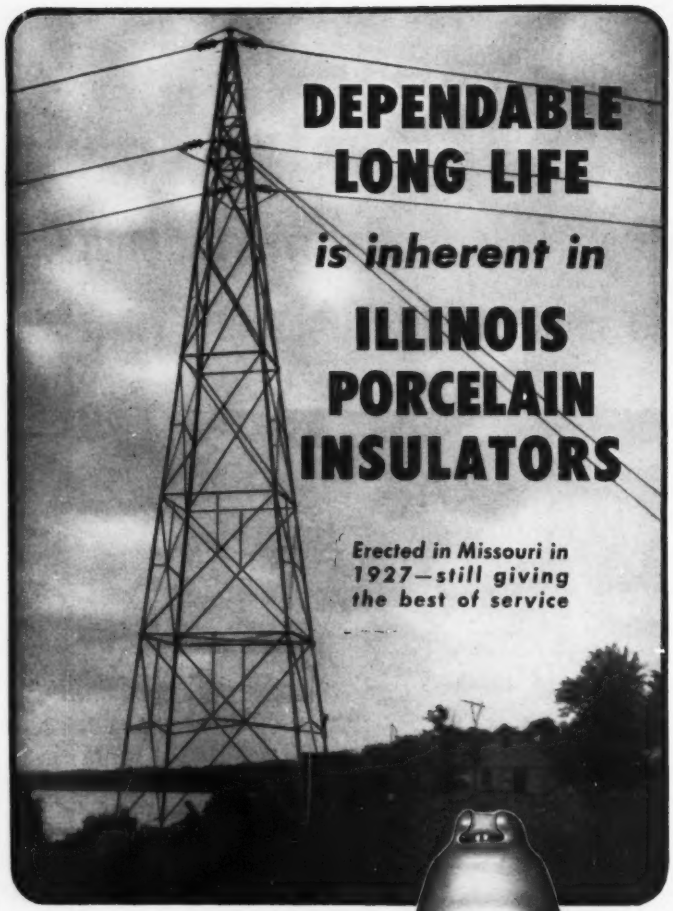
For outstanding electrical work of any kind, call the Electrical Contractor who displays this emblem

QUALIFIED LIGHTING CONTRACTOR AUTHORIZED SYLVANIA SALES SERVICE

SYLVANIA

Sylvania Electric Products Inc., 111 Sutter Street
San Francisco 4, California

FLUORESCENT TUBES, FIXTURES, SIGN TUBING, WIRING DEVICES; LIGHT BULBS; RADIO TUBES; TELEVISION PICTURE TUBES; ELECTRONIC PRODUCTS; ELECTRONIC TEST EQUIPMENT; PHOTOLAMPS; TELEVISION SETS

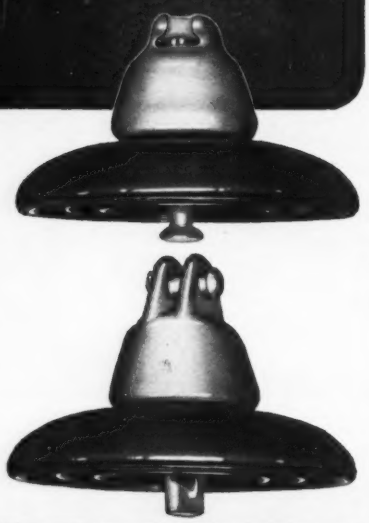


SUSPENSION TYPE INSULATORS

Produced to Illinois' exacting electrical and mechanical standards—completely tested and inspected to insure against breakdown on the job. This, plus a proved record in countless installations like the one pictured above give complete assurance of long years of thoroughly dependable service.

PIN TYPE INSULATORS

Low voltage, high voltage—one piece or multi-part—a complete line of pin type insulators, tested and proved, for every distribution job.



WRITE FOR COMPLETE INFORMATION AND PRICES

ILLINOIS
ELECTRIC PORCELAIN CO.
MACOMB, ILLINOIS

Infrared Strip Unit

(17) Wil-Son Mfg. Co., Dept. WE, Cloverport, Ky.

New single- or multiple-row infrared heating units are designed for building into locations where conventional infrared ovens would not be suitable. They come in 24, 32 and 48 in.; have asbestos insulation. Adjustment ear lugs projecting from both sides permit any number of units to be joined side by side and end to end. Various socket spacings are available. The 48-in. unit, for example, comes with six, eight or nine sockets.

A complete line of attachment feet and other mounting bracket accessories is available. Sockets are mounted in stagger arrangement to provide an overlapping, smooth heat pattern.

The units are designed for R-40 heat reflector lamps; are made of heavy-gage zinc-coated steel.

F Lamp Ballast

(18) Jefferson Electric Co., Bellwood, Ill.

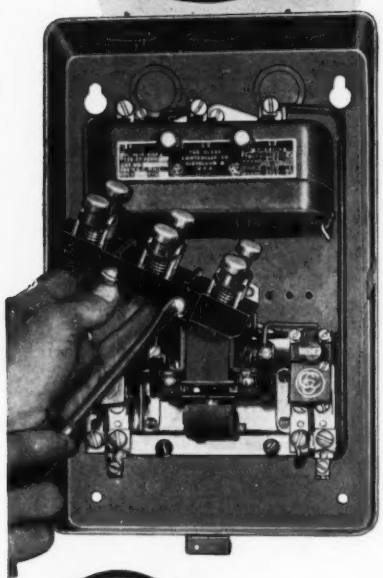
A new series-sequence ballast, catalog 254-511, for the 96T12 fluorescent lamp is claimed to insure positive starting on line voltages as low as 106 v with no detrimental effect on lamp life. Variations in line voltages have no noticeable effect on lamp brilliancy, it is reported. This smaller size, lightweight 425 ma ballast is ETL and UL approved and is designed to meet requirements of the new ASA test specification C82.1 for fluorescent lamp ballasts.

(19) **LABELS**—Topflight Tape Co., 116 E. Market St., York, Pa., is supplying its pressure-sensitive waterproof cloth labeling tape in rolls up to 2,160 in. long, 2 in. wide. The white tape can be printed in one or two colors.

To receive manufacturers' bulletins with additional information on these products, fill in coupon on page 64.

Here are the ANSWERS to your AC MOTOR STARTER QUESTIONS

The All New CLARK TYPE "CY"



Question: What makes a GOOD Motor Starter?

Answer: Dependability in operation . . . ruggedly built for hard usage . . . long life . . . requiring little attention . . . easy inspection and maintenance.

Question: What makes the new CLARK Type "CY" different?

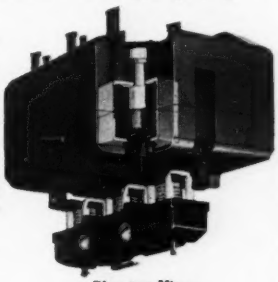
Answer: An entirely new, advanced principle of arc interruption; combining strong, multi-turn magnetic blowouts and twin-break contacts.

Question: How does this improve its operation?

Answer: Constant forced rotation of the arc—moving continuously from a hot to a cold spot, minimizes burning or pitting of contacts.

Question: How about maintenance?

Answer: Longer contact life means less service. No filing, dressing or cleaning of contacts required. No tools necessary to inspect contacts. Contacts, coils and other components easily changed. The CLARK Type "CY" is the maintenance man's dream!



Phantom View Showing Arc Shield

Question: Is it rugged?

Answer: Mill Type heavy-duty construction and design provide extra protection and dependable operation in severe service.

Question: Any other advantages?

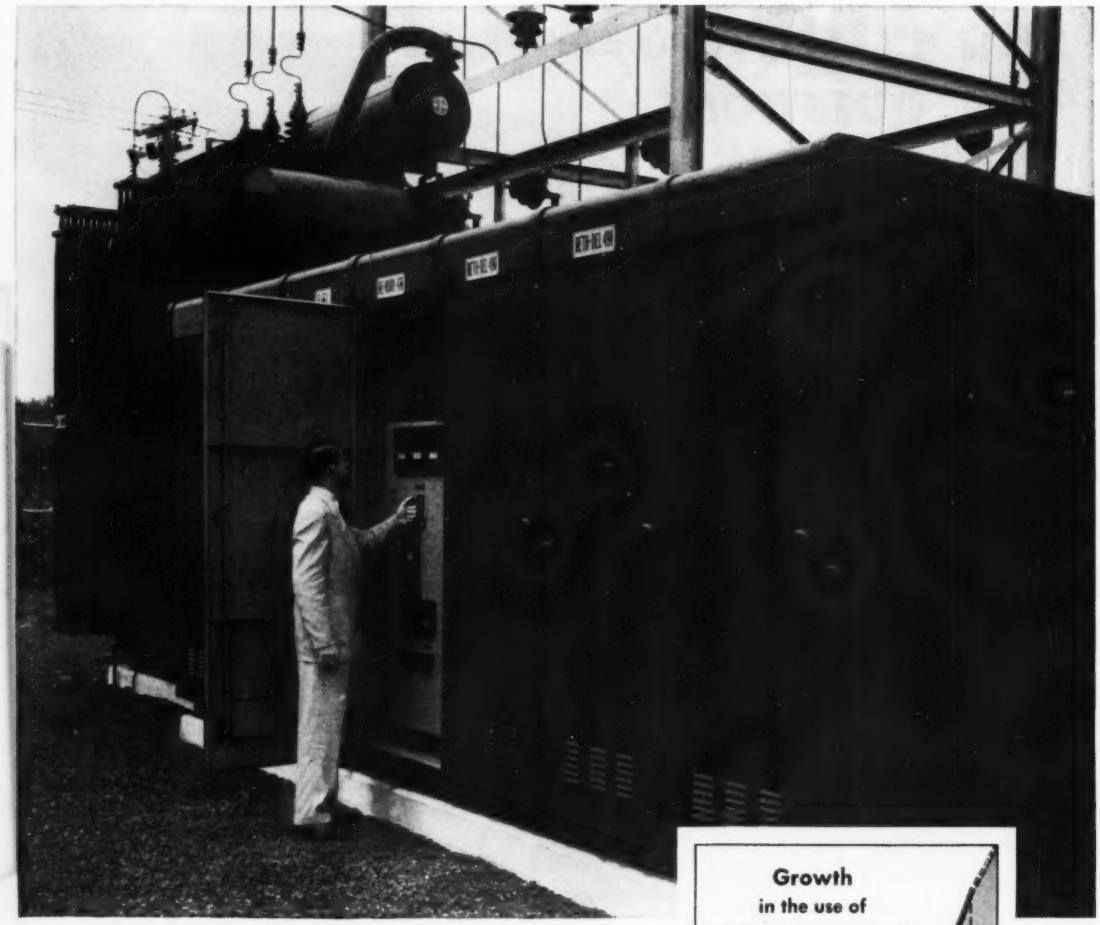
Answer: Many—among them the ingenious design of the solid upper arc shield that prevents accumulation of hot gases between wiring terminals, minimizing phase-to-phase failures.

Let a CLARK application engineer show you what this new line of CLARK Type "CY" Starters means to you in increased production and lower maintenance.

THE CLARK CONTROLLER CO.

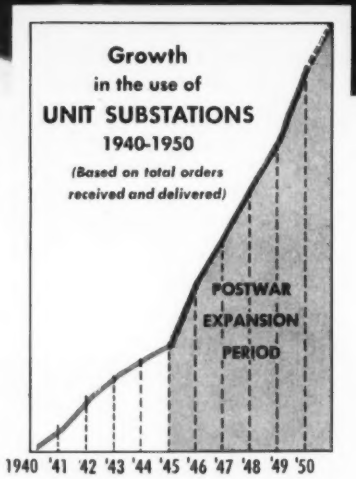
ENGINEERED ELECTRICAL CONTROL • 1142 EAST 152ND STREET, CLEVELAND 10, OHIO

Niagara Mohawk EXPANDS FAST at



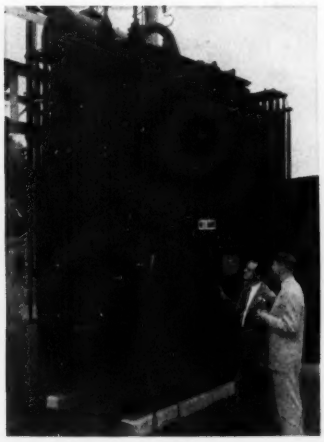
NIAGARA MOHAWK ADDS 10,000 quickly and easily with third and fourth G-E master unit substations (5000 kva each). The one above transforms 33 kv to 5.04 kv. Open compartment door shows operating panel for magne-blast breaker. More details in photos on opposite page.

WHAT DOES THIS TREND MEAN? Savings in time, money and materials are becoming more and more important. It also means that adaptable compact unit substations have proved to be perfectly suited in cases where "special designs" were thought necessary. You get plenty of flexibility when you use G-E packaged substations.

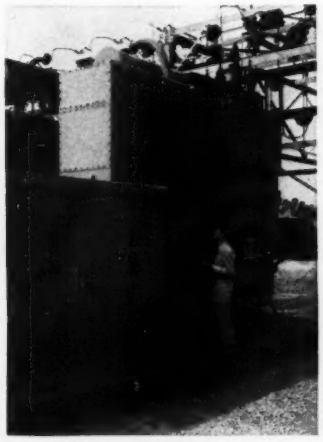


low cost—with G-E Unit Substations

CIRCUIT BREAKERS are safely and easily removed for inspection. This view shows rear of Niagara Mohawk's new G-E metal-clad transformer main breaker in operating position. Breaker cannot be lowered for removal until it is tripped and power circuit interrupted.



YEARS OF MAINTENANCE-FREE SERVICE ahead for transformers in Niagara Mohawk's new unit substation. Bus regulation of voltage is provided by load-ratio-control equipment. Experience shows G-E LRC equipment requires *very* little maintenance.



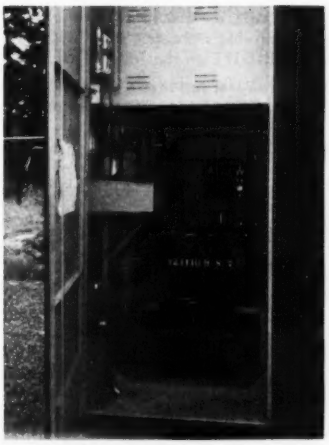
FORESIGHT PAYS OFF again and again. Above is section of older G-E master unit substation installed by Niagara Mohawk in 1939. Growing loads posed no problem—new unit (barely visible, upper left) installed alongside, capacity increased by 5000 kva.

Quick, easy ordering and installation help Niagara Mohawk expand fast to meet increased demand in Albany area

Like many other utilities and industrial plants, Niagara Mohawk Power Corp. has shown it pays to use "packaged" power equipment. In this locality, they've chosen a standard distribution system (in this case: primary network) and a standard load increment, or "building block" of power (5000-kva). As load grows, a duplicate substation of this capacity is tied into the system, always a jump ahead of demand.

A G-E unit substation arrives ready for use—you simply spot in place, connect, and energize. You save not only on equipment and installation costs, but also valuable engineering time to use for over-all planning.

These are just a few reasons for the fast-growing trend to unit substations shown in the chart on the opposite page. Your local G-E representative can show you plenty of others. Call or write him. *General Electric Company, Schenectady 5, N. Y.*



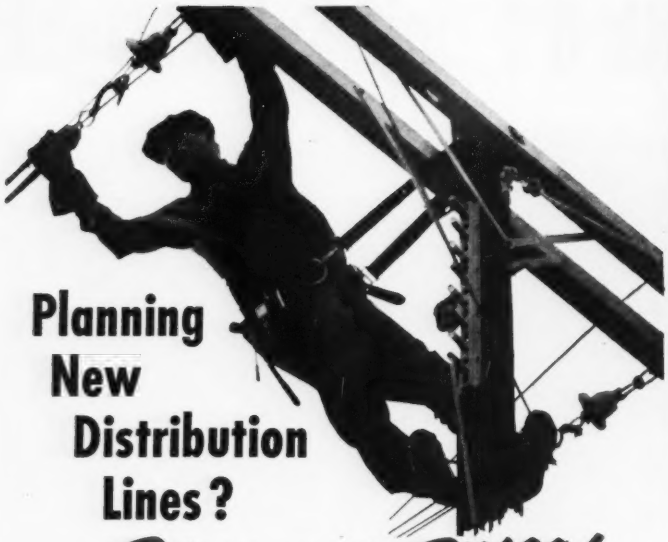
EXTRA $5000 SAVED BECAUSE OF FLEXIBILITY

IDEA TO SAVE MONEY: Photo above is close-up of G-E metal-clad auxiliary compartment, installed with rest of Unit Substation. Flexibility permitted Niagara Mohawk to install 48-volt battery, charger, telephone. By doing this instead of using special construction, Niagara Mohawk estimates they saved $5000 to $8000.

321-80

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.



Planning New Distribution Lines?

Put it up to PINCO!

Putting up a Distribution Line is no problem when you "Put it up to Pinco" . . . because Pinco has everything you need—Insulators . . . Line Hardware . . . Guy Strains. Pinco makes them all, and they're all "tops" in performance as thousands of miles of such lines can prove. Engineered and built to distribution line requirements, Pinco products are not only RIGHT *for* the Job but RIGHT *on* the Job . . . for You!

Refer to Pinco Catalog No. 49 for complete electrical and mechanical characteristics.

No. L63

Pinco Pin Type

No. L223

Pinco Pin Type

No. L1510

Pinco Suspension Type

No. L4038

No. L1921

No. L4550

Pinco Strain or Dead-End Clamps

Pinco Guy Strains

Nos. L289
L506
L504
L502

The Porcelain Insulator Corporation

769 Main St., Lima, N. Y.

Warehoused and Distributed by JOSLYN PACIFIC CO.

1434 FIRST AVENUE SOUTH ..... SEATTLE 4, WASHINGTON
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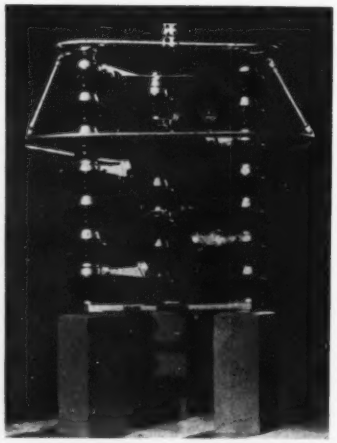
Suspension Insulators . . . Switch and Bus Insulators . . . Distribution Clamps . . . Distribution Pin Types and Guy Strains . . . Transmission Line Fittings . . . Tree Insulators . . . Transformer and Circuit Breaker Bushings . . . One Piece and Multi-part High Voltage Pin Types . . . Suspension and Strain Clamps . . . Indoor Bus Support Porcelain . . . Lightning Arrester Porcelain

★ PINCO INSULATORS ★



Arrester

(20) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

This low height station-type self-supporting arrester varies in ratings from 195 through 242 kv; has a spiral staircase pattern to eliminate expense of supporting structure and bracing insulators. The assembly is designed for protection of station equipment where space is limited.

A complete single-pole arrester consists of a series of type SV arrester units mounted spirally between supporting columns of standard apparatus insulators, an arrangement that reduces height and gives more head room.

(21) **FUSE COUPLING** — A device claimed to reduce danger from fires caused by damaged cords is offered by the K. H. Smith Mfg. Co., 3037 Carroll Ave., Chicago. The Fireguard fits into any standard wall outlet; contains a small fuse that breaks the circuit instantly when a short occurs in the connected lamp or extension cord. The cartridge fuse fits into a small opening on the prong side of the coupling and can be replaced when blown. Outlets are provided on the device for two plugs. Underwriters' approved.

(22) **SWITCHES**—A new line of magnetic switches, including magnetic contactors, automatic transfer switches and automatic reversing switches is offered by the Lumenite Electronic Co., 407 S. Dearborn St., Chicago 5. According to the manufacturer, these switches are able to handle the rated capacities with a wide margin of safety. The reversing and transfer switches are fitted with both electrical and mechanical controls.

(23) **DEODORIZER** — The adjustable electric fan-operated air freshener made by Surco Products Inc., 918 Wylie Ave., Pittsburgh 19, Pa., is cased in aluminum and comes in three colors, red, green or gold. It can be adjusted to meet area requirements.

D-H RADIO ALLOYS

Provide Important Parts for

DU MONT'S

Selfocus Teletron

Latest development in picture tubes is the Du Mont Selfocus Teletron which provides *automatic focus at all times without the aid of external circuits or devices.* This eliminates the focusing coil or PM unit now used on standard electromagnetic-focus picture tubes, affording a substantial saving of vital materials in the manufacture of television receivers.

The Selfocus Teletron employs electrostatic focus with magnetic deflection, and this type of receiver is unique among electrostatic-focus tubes because its focusing element is operated at zero volts and is tied internally to the cathode through a resistor.

The elimination of focus circuits from the receiver is made possible largely by the focusing cylinder of the Selfocus picture tube. The unusual design of the cylinder and the precision with which it can be located in the electron gun produce increased picture quality by minimizing defects which have been inherent in conventional picture tubes. With greater control of these defects, it is possible to maintain quality uniformly from tube to tube.

Driver-Harris, who has been supplying Du Mont with alloys for cathode ray tubes for more than 10 years, supplies Stainless Steel 18-12 and special D-H Nickel No. 599 for manufacture into important parts of the electron gun of Du Mont's new Selfocus Teletron. The special requirements of this facet of the television industry are well served by the properties of these metals.

At present, strategic materials and the alloys made from them are inevitably on strict allocation. However, we shall be glad to make recommendations based upon your specific needs, and serve you to the best of our ability.

Makers of the most complete line of electric heating, resistance and electronic alloys in the world

Driver-Harris Company

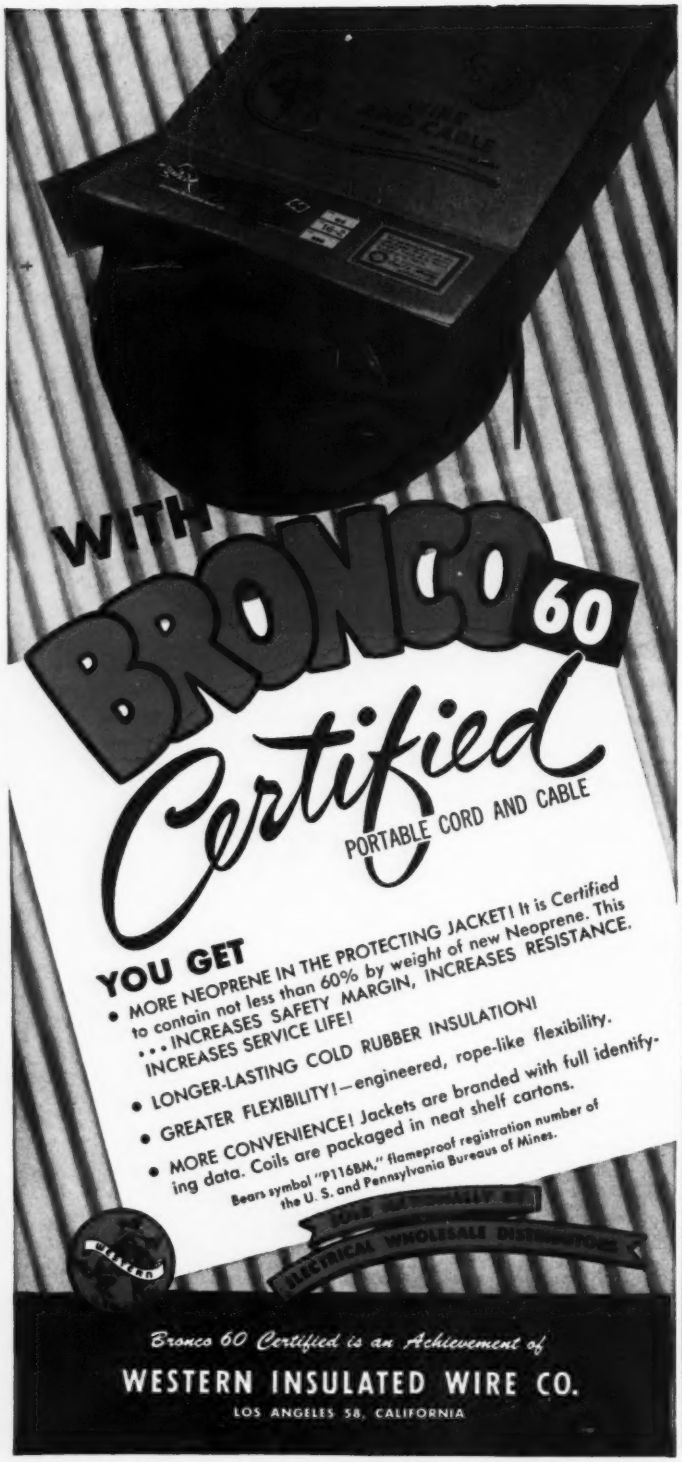
Western Representative: **ANGUS-CAMPBELL, INC.**

1114 Valencia St., San Francisco 449 So. San Pedro St., Los Angeles

Main Office and Plant: HARRISON, NEW JERSEY

SPECIAL PURPOSE ALLOYS SINCE 1874 — D/H — TRADE MARK REG. U. S. PAT. OFF.

*T.M. Reg. U.S. Pat. Off.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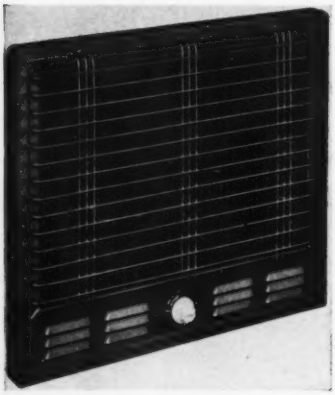
BRONCO 60
Certified
PORTABLE CORD AND CABLE
YOU GET
• MORE NEOPRENE IN THE PROTECTING JACKET! It is Certified to contain not less than 60% by weight of new Neoprene. This ... INCREASES SAFETY MARGIN, INCREASES RESISTANCE. INCREASES SERVICE LIFE!
• LONGER-LASTING COLD RUBBER INSULATION!
• GREATER FLEXIBILITY!—engineered, rope-like flexibility.
• MORE CONVENIENCE! Jackets are branded with full identifying data. Coils are packaged in neat shelf cartons.
Bears symbol "P116BM," flameproof registration number of the U. S. and Pennsylvania Bureaus of Mines.
ELECTRICAL WHOLESALE DISTRIBUTORS
Bronco 60 Certified is an Achievement of
WESTERN INSULATED WIRE CO.
LOS ANGELES 58, CALIFORNIA



Heating Panel

(24) Berko Electric Mfg. Corp., 179-05 Jamaica Ave., Jamaica 3, N. Y.

This unit produces radiant heat rays by means of a Pyrex glass sheet backed by a solid conductive coating, 16-millionth of an inch thick. It has no grids or coils. Two bus bars with multiple silver-clad spring contacts provide electrical contact with the two terminating edges of the conductor.

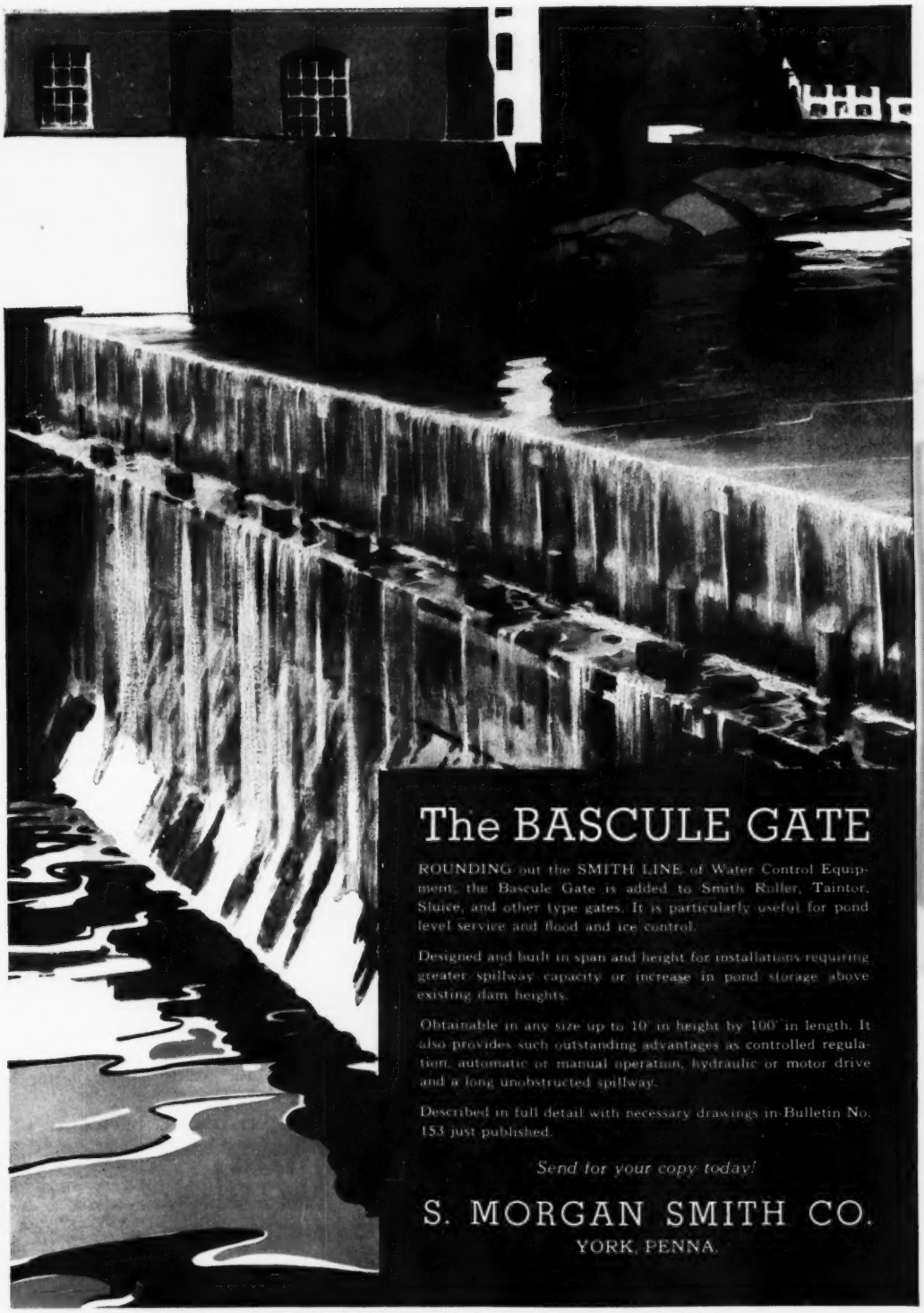
According to the manufacturer, during tests over more than a year the 1,000-w units have been stepped up to as much as 4,000 w and panels in normal operation have been sprayed repeatedly with a stream of water without breakage.

Governed by thermostats, the panels can maintain different temperatures in different rooms of the same building. Three types are available: standard, Select-A-Temp (with built-in thermostat), and Select-A-Temp Jr. (for small rooms). The element is daylight blue, with a chrome-like guard.

(25) ANODE — A 30x60-in. graphite ground anode has been announced by National Carbon Co., 30 E. 42nd St., New York 17. The new anode is claimed to provide longer life because it has more pounds of graphite per unit of exposed surface. It comes with insulated No. 8 weatherproof cable 36 in. long.

(26) FOG CAP—Pinco L5206 fog cap, in use on coast installations for many years, is now suggested by its manufacturer for areas where airborne industrial and chemical wastes are an operational hazard. The device is designed to protect the upper part of the bushing from contamination and moisture. Made by Porcelain Insulator Corp., Lima, N. Y.

For more data fill in coupon on page 64



The BASCULE GATE

ROUNDING out the SMITH LINE of Water Control Equipment, the Bascule Gate is added to Smith Roller, Taintor, Sluice, and other type gates. It is particularly useful for pond level service and flood and ice control.

Designed and built in span and height for installations requiring greater spillway capacity or increase in pond storage above existing dam heights.

Obtainable in any size up to 10' in height by 100' in length. It also provides such outstanding advantages as controlled regulation, automatic or manual operation, hydraulic or motor drive and a long unobstructed spillway.

Described in full detail with necessary drawings in Bulletin No. 153 just published.

Send for your copy today!

S. MORGAN SMITH CO.

YORK, PENNA.

THE MARK OF

MARCUS MTC

QUALITY

General purpose transformers, 600 volts and below; 1-15 KVA inclusive, single or three phase.

The formula for the latter remains unchanged. The combination of a good product with genuine interest in the customers' side of the transaction has necessitated the completion of our third and largest expansion move within the past 5 years. What better recognition of the *"Mark of Quality"*!

•

Representatives in Principal Cities

450 KVA, Type F Unit Substation, 4160 V. Delta, 60 Cycles, 3 Ø—120/208Y, 4 wire.

PIONEERS IN THE FIELD OF AIR-COOLED TRANSFORMERS

MARCUS DRY TYPE transformers

ONE OF THE WORLD'S LARGE MANUFACTURERS OF DRY TYPE TRANSFORMERS EXCLUSIVELY.

1 to 2,000 KVA up to 15,000 Volts to meet Individual Requirements

• DISTRIBUTION • GENERAL PURPOSE • UNIT SUBSTATION • PHASE CHANGING • ELECTRIC FURNACE • RECTIFIER • WELDING • MOTOR STARTING • SPECIAL

NEMA

MARCUS TRANSFORMER CO., Inc.

[illegible] ST.—BRIDGE 5, NEW JERSEY

(27) TWO-WAY RADIO—A low power 2-way radio utilizing the Uni-Channel Sensicon receiver has been designed by Motorola, 4545 W. Augusta Blvd., Chicago 51, Ill. The unit meets FCC regulations that allow a maximum power input of three watts to the final amplifier for those industries in which all 2-way radio communications are carried on within a single plant area. Can be installed either as base stations or as mobile units; come as a single package with built-in speaker and control head or with individual speaker and control head. Models are available for operation from 6-v d-c, 12-v d-c or 117-v a-c primary power source.

(28)—F SIGN LAMP—A fluorescent sign lamp with choice of color combinations has been announced by Duro-Test Corp., North Bergen, N. J. The sign message is contained within a glass tube filled with an invisible gas that causes lettering to fluoresce in brilliant colors when excited by an electric current. Any number of colors can be combined in one design. Background color can be in contrast to lettering. The unit can be plugged into any a-c outlet and only standard voltages are required for operation. Sign consumes about 20 w.

(29) ATTACHMENT — The Lok-Gyde for fluorescent lamps channels the terminal pins into the sockets and locks the lamp when it is in the sockets. It will slip over any standard 15 to 40 w fluorescent socket and becomes a permanent part of the fixture. Operation of lamp or fixture is not affected, according to the manufacturer, Edison Electrical Co., 355 Weybosset St., Providence 3, R. I.

(30) FLOODLIGHTS — Space-Liters, Series 2500, porcelain elliptical type floodlights are available with mounting fittings for crossarm, wall, pipe or pole-top applications; for general service type PS-52, 300-1,500-w lamps, bi-post type T-24, 750-1,000-w lamps and mercury vapor lamps type T-16, 400-w. Bulletin 1051 giving details is available from Steber Mfg. Co., Broadview, Ill.

(31) PRODUCTION LIGHTING—Controlled brightness contrast ratios are available from the new Wyte-Liners announced by the Edwin F. Guth Co., 2615 Washington Ave., St. Louis 3, Mo. The fixtures are all white; reflector surface is of 300° Permalux or porcelain enamel. Available in two and three conventional 40-w light units for 4- and 8-ft slimline lamps and in 4- and 8-ft lengths.

(32) RECORDER—An instrument for recording daylight intensity is being offered by Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa. It consists of a Speedomax recorder and a specially designed Illuminometer cell assembly; is said to be an accurate, automatic means for recording daylight intensity directly in foot-candles.

(33) PROTECTIVE DEVICE—The type HRR circuit reclosing relay is a protective device that automatically tests the continuity of a fault for a given number of times at specific spaced intervals. If the fault is cleared during any one of the trial tests, the control is restored to its normal operating condition but, if the fault persists, the device automatically locks out the control circuit until the fault has been cleared manually. Made by the R. W. Cramer Co. Inc., Centerbrook, Conn.

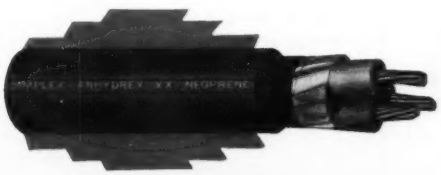
THIS WAY...

Unlike the housewife who uses bread crumbs and other materials to "stretch" the available supply of hamburger, Simplex is not able to add materials to copper to make it go further. We do achieve the same result, but by an entirely different means. Our way is to insulate the copper with Simplex-Anhydrex XX high voltage insulation. It is the very best "copper extender" that we know.

Simplex-Anhydrex XX is a product of Simplex research and development. It is an insulation that is absolutely "tops" in the high voltage field. It is designed to operate at a maximum of 167° to 176°F. (75° to 80°C.) copper temperature, depending on operating conditions. It has all the properties you want in such a high voltage rubber insulation. It will withstand heat. It also withstands ozone and aging, and it is guaranteed not to absorb more than 15 milligrams of water per square inch of exposed surface when tested in accordance with U. S. Coast Guard standards.

So far as we know it is the only insulation of its kind. Use it wherever you have a high voltage problem, whether the cables are to be installed directly in the earth, underground in ducts, under water, or overhead supported from messenger wire.

You can help to "s-t-r-e-t-c-h" the small available supply of copper by insisting that your high voltage cables be insulated with Simplex-Anhydrex XX insulation. Do you want to know more about this unique insulation? Then fill in the coupon below.



SIMPLEX-ANHYDREX XX

SIMPLEX WIRE & CABLE CO.
79 Sidney St., Cambridge 39, Mass.

SIMPLEX WIRE & CABLE CO.
79 SIDNEY ST., CAMBRIDGE 39, MASS.
GENTLEMEN: PLEASE SEND A COPY OF BOOKLET 1009A TO:

NAME_____ TITLE_____

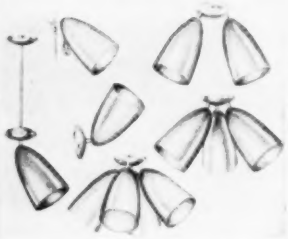
COMPANY_____

STREET_____

CITY_____ STATE_____

The NAME Revere ELECTRIC MFG. CO. CHICAGO, ILL. means FINEST LIGHTING

The name REVERE sums up a long list of features and identifies lighting equipment as products of experience. Just the NAME is sufficient to tell you that not only does every unit more than meet accepted standards of QUALITY . . . but that you can expect DESIGN of symmetry and character. Always say REVERE—and be sure!



SHOW - MASTER FLOOD

With Swivel that stays put at any angle. Adjustable from horizontal to vertical. Versatile mountings—ceiling—wall—clamp-on—single—double—triple and quadruple Cluster Units, with long or short stems. Fits into scores of display applications. Satin Grey finish.

REVERE WHITE-WAY PYLON-LITES

For streets, boulevards, gas stations.

EFFICIENT ENCLOSED FLOODS For airport or sports lighting.

FULL LINE of LUMINAIRES for Incandescent or Mercury Lamps.

HINGED POLES for Street and Gas Station Lighting.

Write for Details

REVERE ELECTRIC MFG. CO.

6016 BROADWAY • CHICAGO 40, ILL.

Stocked by L. M. BAXTER & CO.
San Francisco—Seattle—Portland
Los Angeles Rep.: BRACKEN SALES AGENCY

BULLETINS ETC.

(34) CIRCUIT BREAKERS—Pacific Electric Mfg. Corp., 5815 3rd St., San Francisco 24, Calif., has issued catalog 585 on type RHE reclosing oil circuit breakers, 115 to 230 kv. These breakers have 3-cycle interrupting time, interrupting ratings to 10,000,000 kva at 230 kv. With motor-compressed spring-operating mechanisms, they are electrically and mechanically trip free in any position. They have 10-cycle closing, 20-cycle reclosing; are adjustable up to 45 cycles as required; minimum of 15 cycles is available on order.

(35) CATALOG—Publication of its 1952 catalog has been announced by Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Ill. Radio, television and industrial electronics equipment is included.

(36) CONTROL—A 4-page bulletin on the new Autronic control system has been released by Swarthout Co., 18511 Euclid Ave., Cleveland 12, Ohio. This is a miniature all-electronic system for controlling pressure temperature, flow and level.

(37) CAPACITORS — Cornell-Dubilier Electric Corp., South Plainfield, N. J., has released a 60-page mica and Faradon capacitor catalog. It is listed as No. 420-421.

(38) ELECTRIC COMPONENTS—Stackpole's catalog RC8 lists fixed and variable resistors, iron cores, line and slide switches, choke forms and capacitor units, Ceramag cores. Manufacturer is Stackpole Carbon Co., St. Marys, Pa.

(39) SWITCHES—Micro Switch, Freeport, Ill., has announced bulletin 54 on its precision snap-action switches.

(40) STARTERS—An eight-page folder from Arrow-Hart & Hegeman Electric Co., 103 Hawthorn St., Hartford 6, Conn., describes a new line of Explo-Safe and weatherproof motor starters for hazardous locations.

(41) RADIOS AND TV—Catalog 437 from Mitchell Mfg. Co., 2525 Clybourn Ave., Chicago, Ill., lists the manufacturer's line of portable and table radios and its 17-in. television sets.

(42) LIGHTING—The Holophane Datalog is a 64-page catalog available from the manufacturer at 342 Madison Ave., New York 17. All Holophane products are described and performance, application and installation data are given. Many illustrations, drawings and curves. Introductory pages describe the manufacturer's Light & Vision Institute, where new methods are presented.

(43) TERMINAL BLOCKS—Kulka Electric Mfg. Co. Inc., 633 S. Fulton Ave., Mt. Vernon, N. Y., describes its line of terminal blocks in a 12-page bulletin.

(44) SWITCHES — Type RA load break oil switches are described and illustrated in bulletin DB51 from G & W Electric Specialty Co., 7780 Dante Ave., Chicago 19.

(45) CONTROLS—A new edition of its Controlog has been released by Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio. The 88-page catalog contains essential information on Clark a-c and d-c motor starters, control centers, contactors, relays and other accessories, with open and closed views of the more popular items.

(46) BRAKES—Design and manufacturing changes in its type HM bridge braking systems are listed in a release from Wagner Electric Corp., 6400 Plymouth Ave., St. Louis 14, Missouri.

(47) CONNECTOR—A new bulletin on its QuelArc circuit breaking plugs and receptacles is available from the Pyle-National Co., 1334 N. Kostner Ave., Chicago 51. These units are for portable electrical equipment from 20- to 200-amp rating.

ELECTRICAL WEST *Not good after January 1*
68 Post St., San Francisco 4, Calif.

Please send me, without obligation, the new product information or catalogs described on the following pages and identified by numbers circled below:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42
43 44 45 46 47

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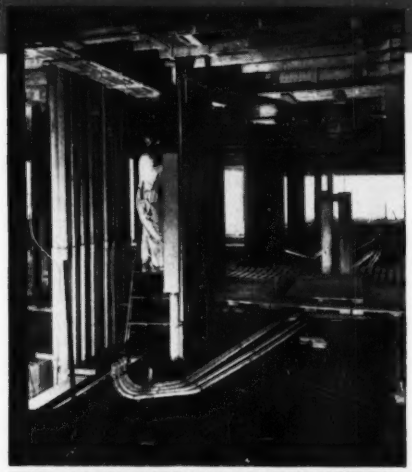
* Please include your company's name and your position, since we cannot ask manufacturers to furnish literature unless you do.



IT'S SPANG CENTRAL CONDUIT

When construction is completed the three modern skyscrapers at Pittsburgh's Gateway Center will be equipped from top to bottom with Spang Central Conduit—a transformer to penthouse installation for power, light and communication.

Following closely on the erection of the structural framework, the main electrical arteries of Spang Cenlaco Conduit climb from floor to floor. As quickly as bays are completed, webs of Spang Central Black Conduit are laid to every outlet point.

The selection of Spang Central Conduit for these Pittsburgh office building landmarks is further recognition of Spang controlled quality conduit known and used everywhere because of its time-proved dependability and workability.

Wherever conduit is specified for commercial, industrial, or residential construction be sure to ask your distributor for Spang "Cenlaco", "Central Black", "Central White" and "Central EMT."

Owners:
The Equitable Life Assurance Society of the United States, New York, New York
General Contractor:
Starrett Bros. & Eken, Inc., New York, New York
Electrical Contractor:
Lord Electric Company, Inc., New York, Pittsburgh and Boston

SPANG-CHALFANT
Division of The National Supply Company
GENERAL SALES OFFICE:
GRANT BUILDING, PITTSBURGH 30, PA.
District Offices and Sales Representatives in Principal Cities

ELECTRA'S HUSBAND

"I THOUGHT high school youngsters did a thorough job of brutally murdering the English language but since we've been here in the East I'm inclined to give the prize to the politicians." Electra made this comment one Sunday morning while wading through the Sunday editions of the New York *Times* and the *Herald Tribune*. "The obscure and meaningless words and phrases they use to gloss over their mistakes and to confuse the issue are worse than the silliest high school slang. How do you explain it?"

"It's a natural defense mechanism for the government lawyers, sociologists, economists and bureaucrats who find themselves completely over their heads in the complex economy the country is in today," I answered. "Because they are as confused as a little boy who has lost his gum in a chicken house, they try to hide their ignorance with a lot of involved language. Maury Maverick, the Texas Congressman, invented a word for it—'gobbledygook.' The spirit and objective of this fancy language is to cover up errors and to give credence to ideas, plans and programs that would never pass muster if expressed in simple English."

"Well it seems to me that there is a lot more gobbledygook than usual," she commented.

"And why not?" I noted. "There's an election year coming up."

With Electra's interest as a stimulus I set out to collect a representative vocabulary of gobbledygook during the remainder of my 7,000 miles of recent travels. Here is the list of terms and definitions compiled from a variety of sources:

Program: Any assignment that cannot be completed in one telephone call.

To expedite: To confound confusion with commotion.

Channels: The trail left by interoffice memos.

Coordinator: The guy who has a desk between two expediters.

Consultant (or expert): An ordinary guy more than 50 miles away from home.

To activate: To make carbons and add more names to the memo.

To implement a program: To hire more people and expand the office.

Under consideration: Never heard of it.

Under active consideration: We're looking in the files for it.

A meeting: A mass-mulling by masterminds.

A conference: A place where conversation is substituted for the dreariness of labor and the loneliness of thought.

To negotiate: To seek a meeting of minds without a knocking together of heads (i.e., as in labor negotiations).

To Translate Gobbledygook

Reorientation: Getting used to working again.

Reliable source: The guy you just met.

Informed source: The guy who told the guy you just met.

Unimpeachable source: The guy who started the rumor originally.

A clarification: To fill in the background with so many details that the foreground goes underground.

We are making a survey: We need more time to think of an answer.

Note and initial: Let's spread the responsibility for this one.

See me (or let's discuss): Come down to my office; I'm lonesome.

Let's get together on this: I'm assuming that you're as confused as I am.

Give us the benefit of your present thinking: We'll listen to what you have to say as long as it doesn't interfere with what we've already decided to do.

Will advise you in due course: If we figure it out, we'll let you know.

To give someone the picture: A long, confused and inaccurate statement to a newcomer.

Spearhead the issue: You be the goat.

Point up the issue: To expand one page to fifteen pages.

Organizational know-how: Something you have that others don't, and, incidentally, the reason why you should be left in your job.

In process on a lower level: Your papers have been lost.

In the inactive file, pending future action: You heard us, your papers are lost. Take it like a man.

Returned to active file: We found them!

The issue is closed: I'm tired of the whole affair.

That last is the way Electra felt about the whole thing when I presented her with the list.

CONTRASTED to the gobbledygook is another item collected while journeying about the country. This—anonymous—is titled "A modern Decalog for those Who Care About Their City, Their State and Their Nation." Here it is:

1. You cannot bring about prosperity by discouraging thrift.
2. You cannot strengthen the weak by weakening the strong.
3. You cannot build up little men by tearing down big men.
4. You cannot help the poor by destroying the rich.
5. You cannot lift up the wage earner by pulling down the wage payer.
6. You cannot keep out of trouble by spending more than your income nationally or individually.
7. You cannot foster the brotherhood of man by inciting class hatreds.
8. You cannot establish sound security on borrowed money.
9. You cannot build character by taking away man's initiative.
10. You cannot help men by doing for them what they should do for themselves.

"That can all be summed up," Electra said when she read it, "by remembering that the best security for the future is that which you provide for yourself."

TODAY'S philosophy is well expressed by the little girl who told her mother, "From now on, Mother, don't depend on me for anything. Our Sunday school teacher said that if I do my part, God will take care of the rest."

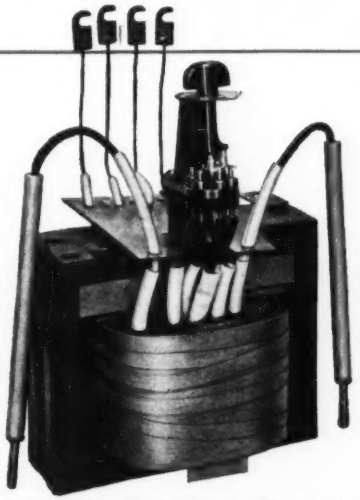
15% Smaller

IN SIZE AND WEIGHT WITH SAVINGS IN OPERATING COSTS

YOU CAN GET higher flux carrying capacity and lower hysteresis losses with the new *Curvacore* distribution transformer. The new transformer with its redesigned core and other improvements gives better performance though reduced in size and weight 15%.

The core of the *Curvacore* transformer utilizes strips of cold rolled steel, shaped to follow the natural path of the magnetic flux. Steel strips are wound, shaped, annealed and cut into two-turn lengths. Each length is fed through the coil structure and then resumes its original curved shape.

The *Curvacore* transformer can yield real savings in operating costs over the years. Here are the advantages of the new design:



New internally operated tap changer has handle and position indicating dial plate above the oil level.

FORMER FEATURES RETAINED

Where tank wall high voltage bushings are specified, Curvacore transformers retain the simplified angle bushings with handy chuck-type connector.

The Curvacore transformer tank is *Spra-Bonderized* and then a 3-coat baked-on finish of alkyd-resinous paint is added.

The Curvacore transformer is constructed with the same high quality craftsmanship. Each transformer is thoroughly tested electrically and mechanically.

1 EXCITING CURRENT REDUCED BY ONE-HALF
Wound core design provides a more efficient path for the magnetic flux.

2 BETTER RATIO OF COPPER-IRON LOSSES
New core design gives better balanced arrangement of core steel to copper.

3 REGULATION IMPROVED UP TO 15%
Low reactance of design results in lower impedance.

4 THERMAL CAPACITY IMPROVED
Increased cooling area within the windings reduces the copper-to-oil temperature gradient. Improved cooling results in added years of service life.

5 SIZE AND WEIGHT REDUCED BY 15%
The reduction in size and weight makes the *Curvacore* transformer easier and cheaper to handle and to install.

Curvacore TRANSFORMERS

Economies resulting from these features mean all-around savings for your system and make the *Curvacore* transformer a good investment.

The *Curvacore* transformer is now available in ratings of 25 kva and lower. Higher ratings will soon be available.

For more information on the new *Curvacore* distribution transformer, call your local A-C sales office or dealer. Or write Allis-Chalmers, Milwaukee 1, Wis. A-3418

Curvacore is an Allis-Chalmers trademark.

ALLIS-CHALMERS A-C ALLIS-CHALMERS

MILLIONS? *yes*

HOW LONG HAVE STAB-LOKS BEEN ON THE MARKET?

Federal Noark introduced Stab-lok Circuit Breakers in mid-year, 1950. Sales were phenomenal right from the start and soon ran into millions. Today the demand is greater than ever.

WHAT ABOUT STAB-LOK DEPENDABILITY?

With millions in service, Stab-lok dependability speaks for itself. Stab-loks are built up to a standard, not down to a price. All parts are *over-size*, and manufacturing economies have been achieved solely by specially designed equipment and mass production techniques.

Stab-loks pass the same rigid Underwriters' Laboratories tests that are applied to the highest priced breakers of the same AC ratings. And Stab-lok is the lowest priced breaker whose performance is absolutely proven.

HOW AVAILABLE ARE STAB-LOKS?

With mass production in full swing, Stab-loks literally pour from the assembly lines. You can usually expect better delivery of Stab-loks than of any other breaker.

WHERE ARE STAB-LOKS SOLD?

Stab-loks are sold exclusively by progressive wholesalers the country over. Outmoding all popular fusible equipment up to 60 amps, Stab-loks won nation-wide distribution as soon as expanded production facilities enabled Federal Noark to meet the demand.

WHAT ARE STAB-LOK'S OUTSTANDING ADVANTAGES FOR CONTRACTORS?

Stab-lok enables contractors to give customers the safest, most convenient and modern circuit protection at fuse box prices! It is outstandingly easy to install. Enclosures have ample wiring space, and most of them are of the Noark combination type for flush or surface mounting. In addition, Stab-lok's low cost and the flexibility with which it meets almost any requirement makes it ideal as a stock item for contractors' shops and trucks.

AND NOW, BREAKERS FOR GREATER LOADS!

Now three new lines of Noark circuit breakers are in production . . . Type NE in 1, 2 and 3 pole construction with 250 volt AC and 50 amp. DC ratings . . . Type NF for up to 100 amps. at 600 volts . . . Type NK up to 225 amps. at 600 volts.

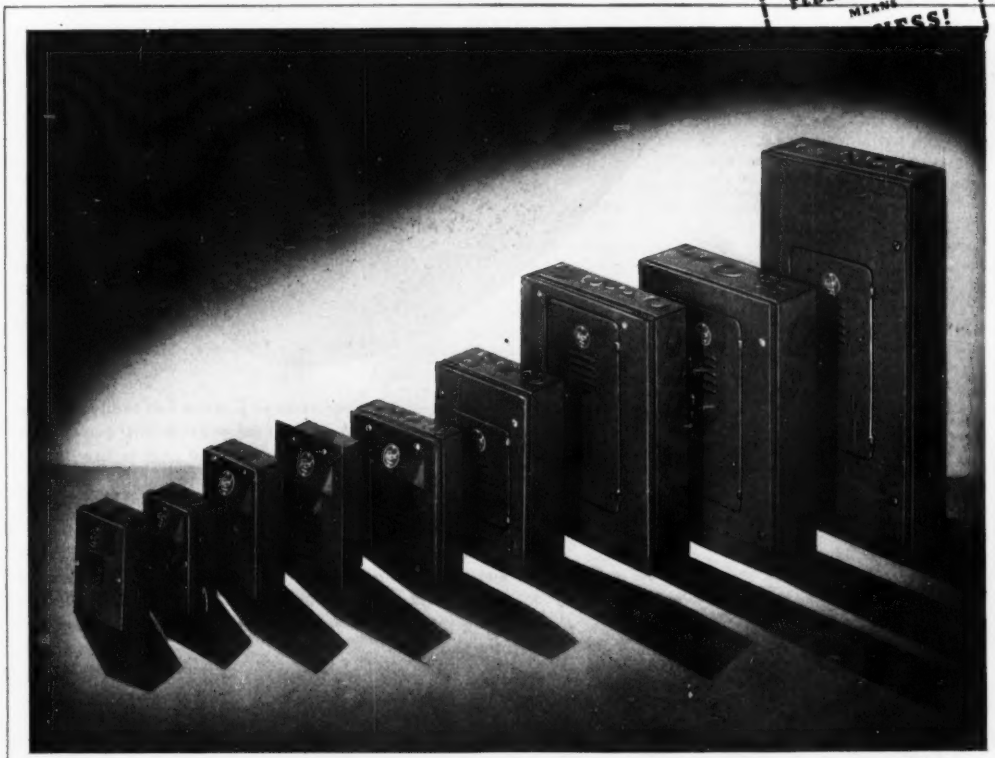
Get the full Stab-lok story—and order Stab-loks—from your wholesaler today. Federal Electric Products Company, 50 Paris St., Newark 5, New Jersey.

MILLIONS

OF *Stab-loks*

REGISTRATION APPLIED FOR

FEDERAL NOARK MEANS ...ESS!



FEDERAL NOARK

Federal NOARK

Complete line of Federal Electric Products includes Motor Controls, Safety Switches, Service Equipment, Circuit Breakers, Panelboards, Switchboards, Control Centers, Bus Duct ★ Sales offices in principal cities.

VICTOR No. 26-R PINTYPE

Distribution's Biggest Value!

V SPECIALLY DESIGNED for medium voltage lines up to 25 KV.

V MODERN, PRACTICAL DESIGN enables us to make production economies and thus offer this insulator to you for less than other pintypes available for use up to this voltage.

V HAS RATED 60 CYCLE DRY FLASHOVER OF 95 KV., wet flashover of 60 KV., voltage rating of 27 KV. and leakage distance of 15 inches.

V CONDUCTOR GROOVE is specially designed to facilitate hot-line work.

V SELF-CLEANING DESIGN and long leakage distance cut replacements and maintenance costs in contaminated areas.

V SERVICE TESTED RADIO-FREE GLAZE gives a maximum RNI of 100 MV. at 15 KV., cutting interference to a minimum for the life of the insulator.

VICTOR NO. 26-R MEDIUM VOLTAGE PINTYPE. For complete engineering data on this insulator and on other sizes and types, write today for Bulletin No. 4.

Do You Know that...

VICTOR was the first manufacturer of wet process porcelain to utilize American clays exclusively. Its raw materials come from Georgia, Florida, Pennsylvania, Virginia, Kentucky, Tennessee, New Hampshire, Missouri and Ontario, Canada.

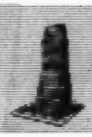
This rugged, medium voltage pintype has really made a hit with power men since its introduction last year. There are many reasons why. Its original cost is low, yet it permits higher insulation levels on present lines and provides for future voltage increases on proposed lower voltage lines.

Made to order for contaminated areas, too. Like all VICTOR insulators, they are made of highest quality *wet process porcelain.* Each is individually inspected at every point of manufacture and electrically tested before shipment.

VICTOR INSULATORS, INC., VICTOR, N. Y.

Specify VICTOR PINTYPE INSULATORS

ELECTRICAL WEST
SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.



Win, Lose or Draw—the Public Decides

John E. Loiseau
President, Public Service Co. of Colorado*

To maintain a good and adequate evaluation of the tangible, physical and financial aspects of our business through observation of our physical properties, analysis of our statistics, earning statements and balance sheets, and the study of our projections into the future is comparatively easy. It is the vagueness and unpredictableness of the intangibles that really is baffling.

The intangibles to which I refer can all be condensed into two little words—"public opinion." This is the composite of the opinion of employees, investors, customers, legislators, regulators, financiers—all just plain people. Abraham Lincoln once said that with public opinion nothing can fail —against public opinion nothing can succeed.

Public Opinion and Legislation

Public opinion through the years has been a dominant force. It is perhaps more subject to molding in our age than in any other by reason of the modern press, the radio and television, and many other means of communication. The pressure to change men's minds has its effect and this pressure is constant. The result is public opinion. Whether opinion or fact is more powerful is debatable, but opinion founded on fact must prevail over opinion founded on theory or false assumptions.

Today the utility industry cannot shirk its responsibility. It is essential that we participate in the day-to-day process of opinion formation by utilizing all of the avenues, methods and possibilities at our command to present our facts and make clear our position.

Let's look back a few decades and recall from our own experience how the electric utility industry has fared in the opinion of the public as reflected in national legislation. In the early thirties, by reason of the unfavorable publicity originating with the Federal Trade Commission investigation of holding companies and the hearings attendant thereto, the electric utility industry became the "whipping boy" of the period. This situation developed notwithstanding the fact that the utilities were rendering a quality and abundance of service unapproached elsewhere in the world at prices lowest in history and constantly decreasing.

These investigations, hearings and legislative discussions covered a period of seven years from 1928 to 1935, when the Holding Company Act was finally passed. Then followed another five or more years of contest, litigation, etc., during which this subject matter was constantly kept before the public.

While the foregoing were primarily holding company proceedings, they cast a shadow over the entire industry, operating as well as holding companies. This was inevitable because the vast majority of operating companies were owned in whole or in part by holding companies and, naturally, they were involved.

It is not my purpose to discuss here the pros and cons of this issue, but merely to bring out the fact that the entire industry was adversely affected in the opinion of the public by these proceedings. Public opinion was formed. The industry suffered as the result.

Public Power Advanced

It was during this period and in this atmosphere that the public power proponents made their greatest forward strides. The Carl Thompsons, the Norrises, the Rankins, the Ickes, the Rauschenbushes were all in positions of influence and were working practically unopposed for their objectives. The preference clause, which had been in existence for many years and applied as intended, was broadened and written into every piece of legislation involving government power and applied with bureaucratic interpretation never anticipated by the early enacting legislators.

There came into existence power authorities, valley authorities, tax-free and subsidized electric competition, inequitable and discriminatory tax laws, regulation with administrative power to issue orders having the full effect of statutory laws, legislation that opened the doors for the continuing fund, acquisition of existing utilities with government funds, etc. The list seems endless.

Discriminating Acts

Let's enumerate a few of the pieces of legislation enacted during this period, which because of the inclusion of discriminatory sales conditions adversely affected electric utilities and their customers.

First of these was the Tennessee Valley Act of May 18, 1933. The consequence of this act with its TVA

* Extracted from an address before the Rocky Mountain Electrical League, Santa Fe, N. M., Sept. 10, 1951.

development has been well publicized.

The second piece of adverse legislation was the National Industrial Recovery Act of June 16, 1933. It was under Title 2 of this act that money was allocated to the Army Engineers in 1933 to begin construction of the Bonneville Dam and power plant and in 1934 money was allocated to the Bureau of Reclamation to begin construction of the Grand Coulee. It was also under this act that money was provided to carry out the public power program in the State of Nebraska and many other smaller power developments.

The next Act of Congress of particular significance to the utilities was the Bonneville Project Act of Aug. 20, 1937. This act is of significance because of marked changes from the so-called "preference clause" that had been incorporated in various reclamation acts since 1906. One of these changes was that it reserved not less than 50% of the electric energy produced for preference customers and it went further and established the principle of withdrawal of energy from nonpreference customers.

On May 13, 1938 the Fort Peck Project Act became law. This act established the Bureau of Reclamation as the marketing agent for power produced at this project, which was constructed by the Army Engineers. The act gave the bureau powers in the matter of construction of transmission lines and also contained the new preference clause.

The Reclamation Project Act of Aug. 4, 1939 contains the most extensive statement on preferences in any general reclamation legislation and consequently has remained the general standard since then.

Executive Order No. 8526, dated Aug. 26, 1940, designated the Bonneville Administrator, under the supervision of the Secretary of the Interior, as the marketing agent for electric power and energy generated at the Grand Coulee Dam.

Subsequently, this administrator has become the marketing agent for all federal power in the Pacific Northwest.

The Flood Control Act of Dec. 22, 1944, sets up the Secretary of Interior as the marketing agent for all electric power and energy produced at flood control projects constructed by the Army Engineers. This act, of course, also contains the preference clause. Pursuant to the provisions of this act the Secretary of the Interior, by Order No. 2135 on Nov. 21, 1945, created the Southwestern Power Administration. Later, by Order No. 2558 on March 21, 1950, he created the Southeastern Power Administration.

The Tax Record

Let's look at what has happened taxwise:

The electric energy tax came into being in 1932 in the form of a levy on commercial and domestic customers. In 1933 this tax was transferred from customers to the vender utilities and at the same time sales by government organizations were tax-exempt. The Revenue Act of 1941 increased the rate from 3 to 3⅓%.

The World War II excess profits taxes were effective from 1940 to 1945. This law gave no consideration to the fact that public utilities were already regulated as to earnings. The effect was to tax a substantial part of normal or regulated earnings as though they were excess profits.

Aside from the question of taxation, all of this legislation deals with multipurpose governmental projects and the conditions surrounding the sale and transmission of electric power produced therefrom.

It was not the authorization and building of the projects that adversely affected the utilities for similar projects such as the Hoover Dam, without discriminatory sales conditions, can readily be fitted into our economy to the benefit of all.

The decade from 1930 to 1940 may be viewed as the period of adverse public opinion with resultant power legislation.

Public Opinion Changing

During the next decade, 1940 to 1950, we have witnessed the effect of the legislation of the previous 10 years and consequently we may gain an erroneous impression as to progress of public power advocates. Let us keep in mind that only in recent years have the utilities had coordinated national programs for telling their story. Keep in mind also that public opinion on national issues changes slowly and time is required for the reflection of this opinion in legislation.

We do have yardsticks by which we can measure our progress and that is from the surveys of public opinion that are being constantly made on a national basis. Central Surveys Inc., a consultant of PIP, in its 1950 survey shows that 58% of the people want less government ownership of electric power contrasted with 56% in 1949, a 2% gain in one year.

Those wanting more government ownership of electric power decreased from 25% in 1949 to 18% in 1950, a decrease of 7% or more than one-fourth in one year.

Opinion Research Corp. surveys show that the proportion of the public favoring federal government ownership of electric power has decreased from 18% in 1943 to 14% in 1949, and only 10% in 1951.

Legislation Affected

There is also tangible evidence in legislative expression that is most encouraging.

The Tennessee Valley Authority was created in 1933 and the country has been flooded with propaganda on its success. In recent years many efforts have been made to establish other valley authorities. During the last few years the concentration has been on the Columbia Valley Authority and now, because of the recent Kansas floods, efforts are being made to revive the Missouri Valley Authority. So far every effort to create additional authorities has been defeated.

The attitude of Congress in denying government appropriations for the construction of transmission lines where wheeling contracts are in existence is a definite curb; the Keating Amendment to Interior Department appropriation bills now pending before Congress would write into such bills a blanket prohibition.

Likewise, there are the restrictions and limitations on the use of the "continuing funds" in the appropriations proposed for both the Southwest and the Southeast Power Administration. These restrictions prohibit the use of continuing fund money for expansion purposes.

Only a few months ago utility commissioners of 10 Western states met in Seattle and passed a resolution urging Congress to adopt a power policy that would make power from federal projects "available to all citizens and users without discrimination."

In 1950 there was enacted a new Excess Profits Tax Law. This gave recognition to the regulated status of utilities and contains provisions exempting regulated earnings to the extent of 6% of the net money invested in the business, including borrowed capital. Contrasted with the former Excess Profits Tax Law, it has the aspect of fairness with respect to regulated utilities.

The House version of the 1951 Tax Bill, as passed and sent to the Senate, contains a clause specifically repealing the discriminatory 3⅓% electrical energy tax on private utilities.

Sometimes we are prone to expect results too quickly and even without

effort on our part. Representative George Dondero of Michigan recently said in the House that "Today preference has become the hub of the public power wheel." Yet it has been only within the last two years that we in the electric utility business have seen fit to bring this issue to the forefront, notwithstanding the fact that herein lies the seat of most of our troubles.

Here is surprising information revealed in the survey made by Central Surveys Inc. in September 1950. This survey revealed that 89% of electric companies' stockholders and 98% of their customers never heard of the preference clause.

Here is an outright discrimination against our customers and very few are really aware of it. How can we expect the support of public opinion if we are negligent in informing our customers on so vital a subject?

While I have particularly stressed the necessity of publicizing the inequities of the so-called preference clause, which should properly be named for what it is, the discrimination clause, I am fully aware of the necessity of carrying on the broad informational program with respect to our companies and our industry.

Keep in mind that the public power advocates, from their entrenched positions, are pouring forth volumes of propaganda advocating a spending program—something for nothing, subsidies for public power, tax-free and regulation-free. They are making their bid for public opinion.

In this struggle for public opinion, we are no longer on the defensive. We are in the right; we are defending our American Way of Life; we have taken the offensive.

There is at our disposal an abundance of information with which to refute and expose the claims and proposals of those who would advocate another way of life.

But all this ammunition will be to no avail if top management does not open the channels to employees, stockholders, customers—the story simply must be told.

When this is done I have no fear as to the outcome for public opinion is all-powerful, and public opinion founded on truth and fact will be reflected in the rules of the game under which we operate.

To the extent that this contribution is made toward the formation of public opinion depends whether we win, lose or draw in our efforts to halt government ownership of our industry and be permitted to continue to do business in the American Way.

TV and Color

David Davis
TV National Sales Manager
General Electric Co.
at RMEL Convention

Undoubtedly many of you are wondering about color television and when it will be here. We have all read conflicting reports about systems, about how good the pictures are, and when we will have them.

We believe that, barring an expanded war, practical color television will move along at a pace set by engineering developments. Under present circumstances, speaking particularly of the effect of the defense program on numerous consumer products, perhaps two or possibly three years minimum will be required before any widespread color TV program service can be brought about.

If they had to choose between the whirring disc system (the present CBS system) and the electronic system, we don't believe that there are more than a handful of competent technicians who would be willing to say that the disc system is the practical approach to color television. We remember that the revolving, scanning disc was used in the first models of black and white television, and until the experimenters devised the electron picture tube, television was only a crude toy in the laboratory.

The television sets on the market today, which are so good that the industry sold 7,500,000 last year, are not cluttered up with whirring discs.

Today's CBS method of color television is the one that uses a spinning disc to separate the three basic colors: red, green, and blue. It seems obvious to us that the final answer to color television will be found in a system of electronic rather than mechanical control. The version of color television in which we are interested primarily uses a picture tube that contains three electronic guns firing at red, blue and green phosphors on the front of the tube. It is the all-electronic system.

Laboratory perfected versions of these electronic system sets have recently been shown publicly in New York. The color system, the electronic system, on which we are banking, will be one that will not affect your present television set any more than the introduction of four-wheel brakes outmoded the cars with two-wheel brakes some years ago, for you will be able to receive on your black and white set all the television signals sent out.

It is true that some stations might be transmitting in color and it would show up black and white on your old television set, but you will definitely see the programs without any expense or alteration of your set. When color sets are available, they will be slightly more expensive and will probably be the main set for your living room, while you will keep your old black and white set for the study or the maid's room.

Another current topic of interest is Phonevision. One large factor in the industry, who is noted for original thinking, several years ago decided that free television was not economically possible, that advertisers could never be persuaded to spend billions of dollars per year to send things into your home because advertisers, being hard-headed businessmen, couldn't possibly see a fair return on their money from such a wasteful practice. This manufacturer decided that television itself was so attractive to the average American that it would be possible to charge, on your telephone bill, for special entertainment such as the movies. To enforce this charge, he proposed to send out a scrambled signal through the air which could only be decoded by a device that you would rent from the telephone company.

A good deal of philosophical and sometimes heated discussion clouded the air for a while, but he went ahead with his plans, and after many delays, Phonevision actually went on the air on an experimental basis several months ago in Chicago. What was offered were fairly recent Hollywood pictures to a selected test group of about 300 families for $1 per performance.

At first, Phonevision evoked many laudatory comments, particularly praised was the clarity of the movies.

However, after the first month, when the bill for service came in, the test families tended to become more conservative.

Yet the man down the street might be perfectly willing to listen to the half-minute commercial while he got the regular entertainment for free.

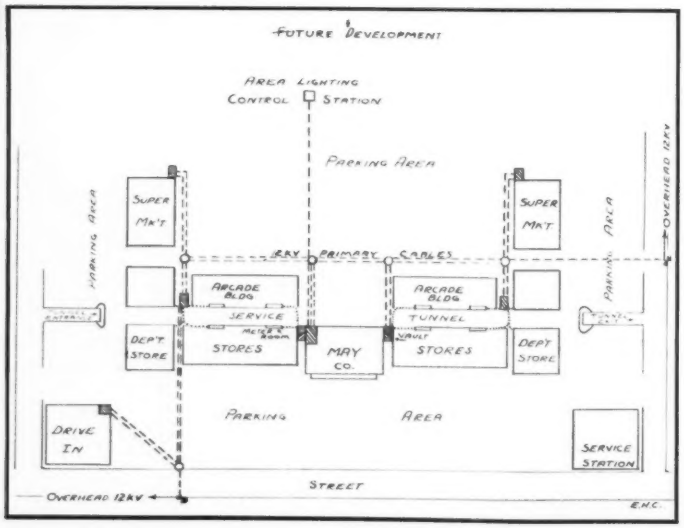
One advantage of Phonevision, which we must acknowledge, is that if listeners are willing to pay for programs, they can get what they want. They can get symphony concerts, for example. They can get forum discussions. Sponsors can scarcely afford to cater to minority interests, for television programs are enormously expensive.

A lot of electrical planning was required to serve a load of 20,000 kw in Lakewood Park project and Lakewood Shopping Center

Planned Distribution for a Planned City

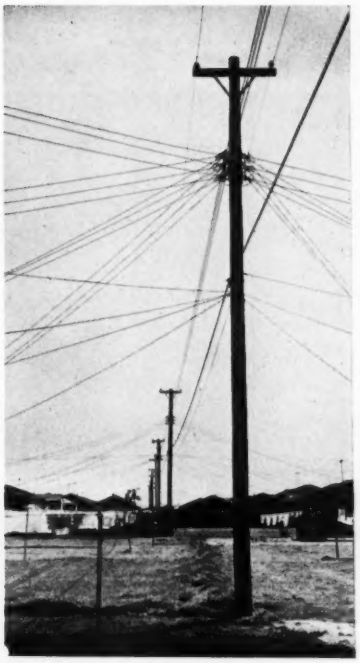
Eugene H. Clark

Distribution Engineer
Southern California Edison Co.



Superlative terms can properly be used to describe the Lakewood Center development in southern California, located between Los Angeles and Long Beach in a growing industrial area. Lakewood Center, occupying 154 acres, will contain 100 major retail businesses, including the $5 million May Co. store, said to be the largest suburban department store in the world. The Lakewood Park residential development, surrounding the shopping center, will contain 17,000 houses and is said also to be the largest tract development in the world. At the shopping center facilities are being provided for parking 15,000 automobiles. Underground tunnels for truck deliveries and loading will keep streets free from heavy traffic.

A tremendous amount of research and planning has been required in connection with this mammoth project. From the very beginning, Albert C. Martin and Associates, architects



Typical street (above) in Lakewood Park. Below: Street lighting in 15,000-car parking area. Right: Typical rear-of-lot joint pole line

for the project, coordinated the entire planning of the electrical system with engineers of the Southern California Edison Co. Constant liaison and exchange of ideas from the initial stages of development has made possible a well-planned electrical system.

To serve the shopping center with a connected load of 14,500 kw and estimated demand of 10,000 kw, presented many special problems to the serving utility. They were not alone those of laying out an adequate electrical distribution system. There were special problems because the entire development is on and will remain private property. Business concerns all lease from the developer of the project.

Much consideration was given to the electrical system for serving the project, including the use of a spot secondary network. The network idea was abandoned for sake of system standardization in favor of a straight radial system using 12-kv primary, 120/230-v single-phase for lighting, and 240-v three-phase for power. The system is as schematically shown in the accompanying sketch.

The project is located about midway between two Edison distribution substations, making possible duplicate 12-kv feed with automatic throwover in the larger transformer vaults. These major vaults are located underground, while there are others for individual customers, like the one illustrated, that are located in a tiled-in enclosure that fits in architecturally with the building served. The large May Co. store takes service at 4 kv and has its own transformer vault in the basement of the building. Smaller customers, adjacent to the underground vehicular tunnel, will be served from meter rooms fed from one of the four main vaults. This keeps meters and services separated from transformer vaults and their special equipment, a desirable feature.

In the transformer vaults there is a G & W automatic transfer load break oil switch in combination with S & C fuses. The two 12-kv alternate cable feeds enter either side of this unit as shown in one of the accompanying photographs. This particular

Highlights of Lakewood Center

1. One-half mile square.

2. Planned shopping center is a planned city.

3. Connected load of approximately 14,500 kw.

4. Estimated demand of approximately 10,000 kw.

5. Reasonably close to 12-kv sources (two stations within 1½ miles).

6. Economic consideration favored 11-kv radial-type distribution employing 120/240-v single-phase 3-wire lighting and 240-v 3-phase power.

7. Automatic throwover, or preferred-emergency equipment installed in each vault for continuity of service and accessibility for maintenance.

8. Power company requested that vaults be located in basements or tunnel area such that, from an economical standpoint, consumers in several different buildings might be served from a common vault.

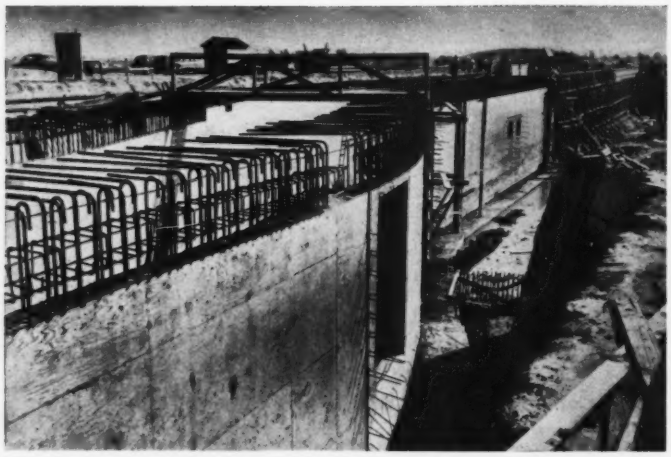
9. Tunnel way presented construction problems for the primary and secondary ducts.

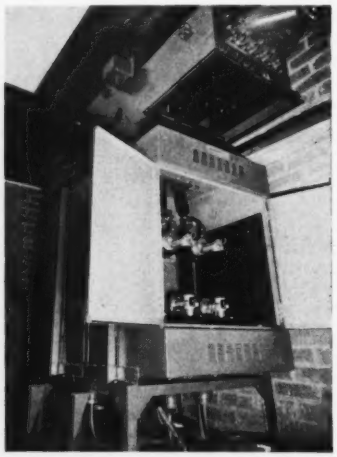
10. Since not all of the buildings are to be built at one time, it was necessary to plan construction of ducts and vaults commensurate with the building program and still maintain two sources of primary 12-kv feed.

11. Water table in area is quite shallow and prior to installation of flood control measures this previous farmland had seen considerable flood waters.

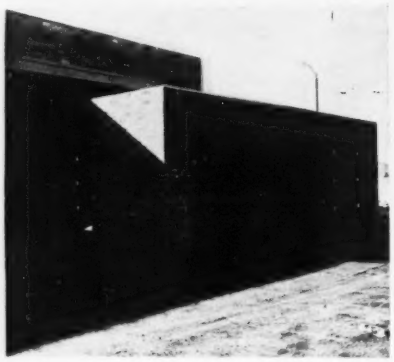
12. Ventilation, sump pumping and illumination of tunnel important feature.

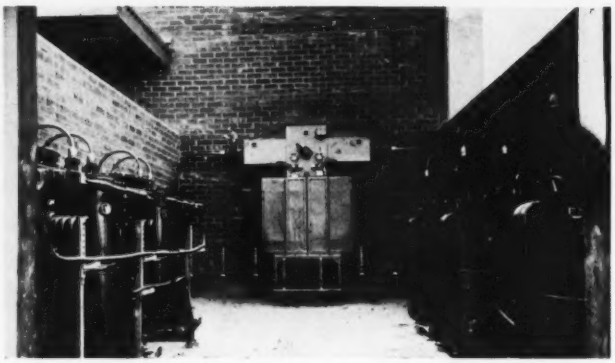
13. Illumination of street and parking areas being coordinated with street lighting expert of the Edison Co.





Vehicular tunnel (left) in shopping center showing transformer vault opening. Right: Automatic load break transfer switch for vaults





Individual customer vaults fit in architecturally with rear of store. Right: Open vault with 12-kv automatic transfer switch at the rear

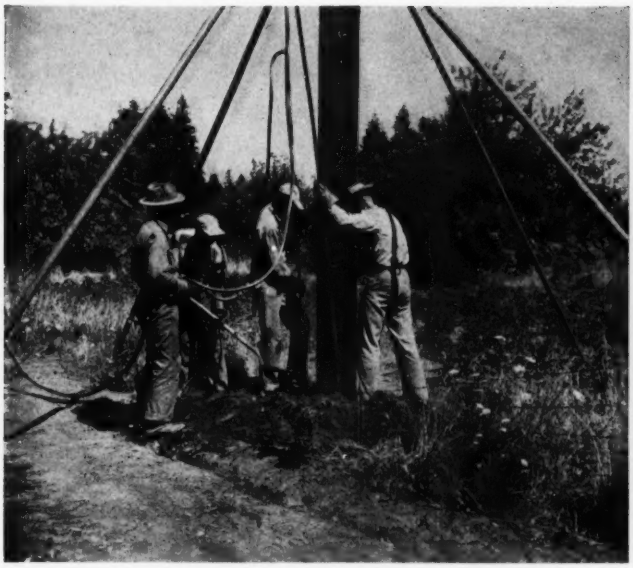
unit is in one of the smaller individual customer's vaults and is not equipped with the automatic throwover feature.

Outdoor lighting facilities establish many "firsts" in developments of this kind. This will be the first use of mercury vapor light sources throughout a business area. It will be the largest business parking area lighting job, and the 15,000-car parking lot itself is one of the largest in the world. Specially designed 35-ft marbleite standards are used throughout the parking area as well as on the streets. Standards are spaced 100 to 200 ft and mount from one to four 20,000-lumen mercury vapor lights on 6-ft arms. Transformer, regulator and switching points were carefully located for convenience and economy in operation, maintenance and initial cost. For maximum flexibility all of the circuits for both the street and area lights were planned to conform to every possible irregular burning schedule for the individual areas.

The Lakewood Park residential development will have 17,000 homes ultimately. About 9,000 of the five- and six-room, low-priced homes are already completed. To serve this "city" of some 70,000 population required a great deal of study by Edison distribution engineers. A number of factors led to the choice of 4 kv for the primary system. All pole leads follow rear-of-lot property lines and are joint with the telephone company. A typical lead is illustrated. Single-phase primaries on short arms run the length of the 800-1,200-ft blocks. Prevailing size of transformers is 15 kva, with about 30 houses to the transformer. An average demand of 500 w per house was used in calculating transformer sizes. Secondaries are three No. 4 copper using racked construction with transformers banked within the long blocks. Services are three No. 8 copper. Main primary feeders traverse the cross streets to feed the single-phase laterals.

In this residential tract it is rather surprising to find that at least three out of every four houses have television. It is also interesting to know that all homes are equipped with Waste King garbage Pulverators, so that there is no garbage disposal problem.

The Lakewood Park residential development and the Lakewood Center shopping district are really tremendous projects. They represent an aggregate load of approximately 20,000 kw. The shopping center will establish a new trend in community development. With its complete shopping facilities, its immense parking area, landscaping, the mall on top of the vehicular tunnel with facing show windows, the careful thought and planning, and the very conception of the whole idea—make the thing fabulous, if one may be pardoned for using the latest ultra superlative to describe an engineering job.



Air tampers do a faster, better and cheaper job in backfilling pole holes. Right: Standard backfill tamper is modifed for pole use

Air Tamping Saves Seven Dollars Per Pole

Sam J. Pearson
Superintendent Outside Divisions
Portland General Electric Co.

Portland General Electric Co. is making a minimum labor saving of $7 per pole by using air operated tamps for backfilling, and by job organization. Before starting to build a 10-mile 57-kv line in 1950, Perry Landsem and Pat O'Connor of the company's Oregon City division decided there must be a faster, better way of tamping poles than the conventional hand tamping.

They investigated the possibility of standard backfill tampers and found the Ingersoll-Rand No. 34 to be most adaptable for the purpose. The original 5-in. head had to be turned down to 3 in. to fit in the hole around the pole, and the 24-in. length of pipe normally used on the tamper was replaced with an 8-ft length of steel tubing as shown. The normal method of operating the tampers is to have them attached to a "T" with valves so that the man handling the hose can turn off either of the two tampers. The stem of the "T" is attached to a hose from the compressor. The tampers cost $147 each complete with modifications, and the hose and fittings cost $17.50 per tamp. A 60-cu-ft compressor will operate two tamps.

Using two tampers, two shovelers, and one man to handle the hose and valves, it is possible to tamp a 60-ft pole in five minutes. Since one of the shovelers removes the pike poles and a certain amount of time is sometimes wasted enlarging the hole to accommodate the tamps, the average time for tamping 55-ft to 70-ft poles will be close to eight minutes.

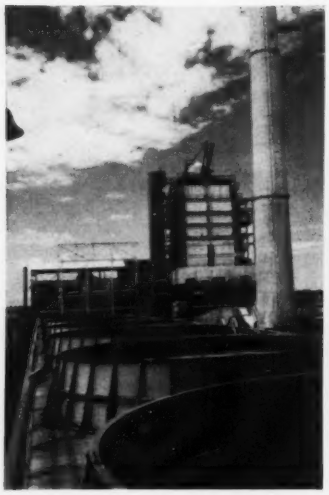
Job Organization

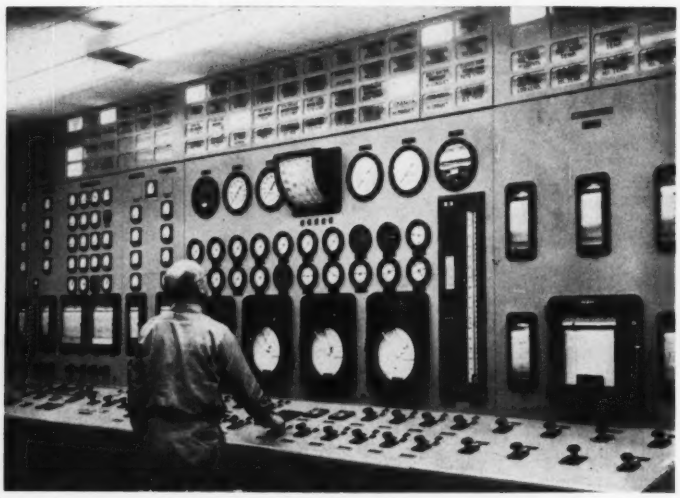
The regular crew for the setting and tamping operations is eight men, consisting of a 6-man line crew and a 2-man hole-digger crew. The 6-man line crew is split into two 3-man crews for framing, and all framing is done several days prior to setting. In the actual setting operations the foreman of the 6-man crew supervises the entire job.

The hole-digger crew digs the hole and sets the pole with the help of the other crew when necessary, which is usually required only when setting through 3-phase primary. When the pole is lined up and the pikes set, the hole digger goes on to the next pole and the tamping crew tamps out the pole just set. By the time the tamping crew tamps a pole and moves on to the next one the hole digger will have the pole in the hole waiting to be lined up.

Using this system such a crew has set twenty 60-ft poles in 6½ hours and will average 15 to 17 poles a day. Other utilities may organize their jobs differently and most of them have a lower wage scale, but our minimum saving using the method described is $7 per pole, as already stated.

So far the air tamps have been used primarily on transmission because of the large saving and the excellent job of tamping. Mechanical tamping has proved far superior to hand tamping. In fact, poles are so solidly set in the ground that it is impossible to pull them the next day by any ordinary methods. Plans are now being made to organize the work of distribution, pole replacements and line extensions so that air tamps can be used.





Gadsby plant (left) viewed from condenser water cooling tower. Right: Centralized boiler control board with annunciators directly above

Gadsby Steam Plant Will Use Reheat Cycle

Pitch from nearby refinery is fuel for first unit

J. E. McKeen

Supervising E. E. Power Division
Bechtel Corp.

The Gadsby steam plant of the Utah Power & Light Co. incorporates the latest thinking in central station design, making use of the reheat cycle, centralized control, automatic feedwater and combustion control, and electrically driven station auxiliaries with automatic functions carried to a high degree. The plant is located within the city limits and approximately one mile from the heart of Salt Lake City. Ultimately the plant will contain three units. No. 1 unit is now in service and No. 2 under construction for operation next year.

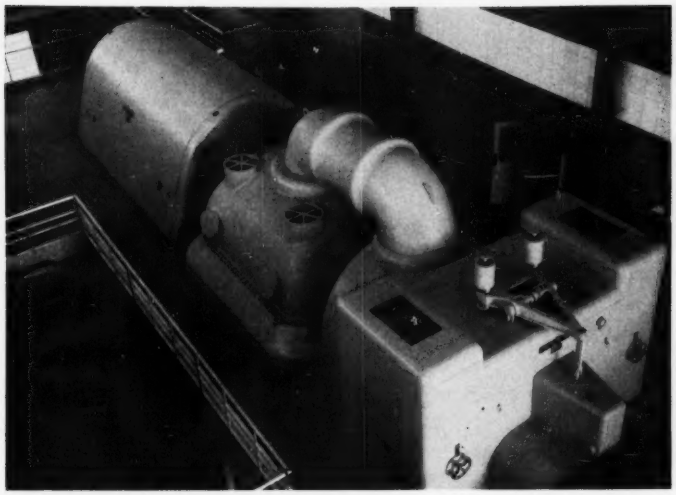
The power company's decision to locate the plant in Salt Lake City was based upon analysis of available sites and net power costs at the load center. Eight locations were considered, including one near available good coal supplies in Wyoming. Costs of power delivered in Salt Lake City were surprisingly close for the several sites considered. Transmission costs more than offset the higher taxes and high cost of condenser cooling water for a plant within the city limits of Salt Lake City, and accordingly the latter site was chosen.

Boilers

Boilers are of the radiant outdoor type, one per unit, with enclosed firing aisles and are designed for burning coal, petroleum pitch or natural gas. Concerning the burning of refinery residue, E. M. Naughton, assistant general manager of the power company, has this to say: "During the period when unit No. 1 was being designed, the Standard Oil Co., which operates a refinery 4.5 miles from the Gadsby plant, contracted to deliver a firm supply of petroleum pitch for full operation of the first unit. This product is the residue from the manufacture of gasoline and diesel fuel and has a very high pour point. On heating to 225° it is sufficiently fluid for pipe line transport, and with additional heating to 350°, can be atomized easily with the use of steam. While space was provided for future coal pulverizing mills and raw coal bunkers, such equipment will not be installed until required.

"The oil company has provided insulated tanks for storage of 80,000 bbl at the refinery and the power company has provided insulated tanks for storage of 60,000 bbl of pitch and regular fuel oil. The oil company owns and operates the 4.5-mile delivery pipe line that is made up of a 14-in. hermetically sealed steel shell, which has expansion loops each 700 ft. Also inside the shell are the 5-in. diameter pitch transport pipe and the 4-in. steam heating line. Steam to heat the north half of the line is furnished by the refinery while the Utah Power & Light Co. will supply steam for the remainder of the heat required."

Boiler for unit 1 is rated 620,000 lb/hr; unit 2, 575,000 lb/hr. Burners for No. 1 boiler are conventional pulverized coal burners but coal supply piping has been omitted. Standard steam atomizing oil guns are installed in the center of the burners. Net design efficiency of No. 1 unit is 32%



No. 1, 66,000-kw unit. Doors lead to operating room separated by glass-steel partitions. Right: Checking firing of a pitch burner

gross. Expected economy is 11,200 Btu per net kwh.

Turbines, Generators

Turbines are of the impulse reaction type rated 60/66,000 kw, 3,600 rpm, 1,250 psig, 950° total temperature, for unit 1, and 60/75,000 kw, 3,600 rpm, 1,450 psig, 1,000°, and reheat to 1,000°, for unit 2.

No. 2 unit will employ the reheat cycle. On the decision to use reheat, Naughton says: "In August 1950, when it was decided to install unit 2, the price of coal had increased in the past two years and was 207% of what it was in 1939. Investigation of the feasibility of using the reheat cycle was made. Present-day practice of using one boiler per turbine-generator made reheat far less complicated, and the general trend was definitely toward reheat.

"Estimates showed that a generating unit of this type for throttle steam at 1,450 psi and 1,000°, and reheat to 1,000°, with required boiler and other facilities, including building extension, would cost about $817,000 more than a 60/66,000-kw preferred standard machine. Analysis showed that the reheat installation could be more than justified on the basis of improved efficiency alone. Also, there was a further advantage of 9,000 kw more capacity in the reheat unit at no cost. Thus, the reheat cycle was selected for unit No. 2 with throttle steam at 1,450 psi, 1,000° and a reheat temperature of 1,000°."

Generators are hydrogen cooled, 13.8 kv, three-phase, 60 cycles, 70/81,000 kva, .5/15 psig hydrogen. The 13.8-kv generator leads are isolated phase, using copper tube conductor enclosed in aluminum housing connecting to the main transformer banks through flexible earthquake joints. Waterproof disconnect switches are located outdoors in the main runs with station service bank disconnects located indoors and connected to the station auxiliary transformer through paper-insulated lead-covered cables. Similarly insulated 44-kv cables for full bank capacity are installed underground for each main transformer to the 44-kv switchyard, located about 1,000 ft from the plant. Each phase is enclosed in a separate duct to provide reliable extended generator leads.

Excitation Systems

Excitation voltage is 250 and is obtained from a direct-connected main exciter with a tandem-connected pilot Rototrol exciter. All auxiliaries, breakers, rheostats, etc., for the excitation and voltage regulating equipments are mounted in a metal-enclosed unit located on the ground floor below the exciter. The voltage regulator consists of a static network unit in conjunction with the Rototrol and provides variable minimum excitation along with usual var control. Provisions have been made for a future motor-driven spare exciter.

Station Auxiliaries

Station auxiliaries are 4,160 v above 300 hp and 480 v below. Normal supply is from the 7.5-mva station service bank with automatic transfer to standby source at the 4,160-v level. Transfer may be made at zero voltage without loss of auxiliaries because of special design of motor control units. Reference to the accompanying single-line drawing will clarify the general auxiliary service scheme.

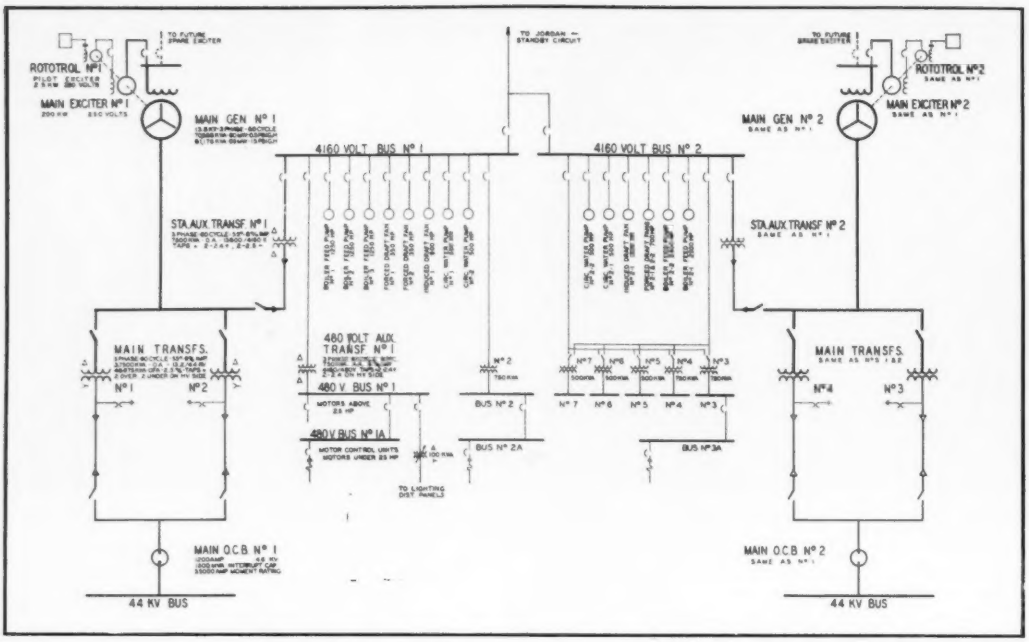
Control Room

Main electrical and mechanical control boards for both units, including the 44-kv ring bus, are located in a single control room at the same elevation as the turbine. Electrical circuits are carried in conduit and expanded metal trays from all parts of the plant and switchyard and go directly to the associated control room without the aid of a cable-spreading or conduit room. Ventilated and well lighted, the control room is relatively quiet with double doors opening into firing aisle and turbine bays. While provisions are not made for the operator to observe the turbine or firing aisle from his normal board position, a few steps in either direction will enable him to observe either.

A comprehensive annunciator system is provided to inform the operator of both electrical and mechanical malfunctions.

125-V D-C Control Source

The importance of a reliable 125-v d-c control source is assured by an adequate station battery, double bus distribution panel and two diverter pole-type motor-generator battery charging sets.


ROTOTROL N° 1
MAIN EXCITER N° 1
MAIN GEN N° 1
4160 VOLT BUS N° 1
4160 VOLT BUS N° 2
ROTOTROL N° 2
MAIN EXCITER N° 2
MAIN GEN N° 2
STA AUX TRANSF N° 1
STA AUX TRANSF N° 2
MAIN TRANSFS.
480 VOLT AUX TRANSF N° 1
480 V BUS N° 1
480 V BUS N° 1A
BUS N° 2
BUS N° 2A
BUS N° 3A
MAIN O.C.B. N° 1
MAIN O.C.B. N° 2
44 KV BUS
44 KV BUS

Single line schematic for Gadsby plant showing excitation system, main power circuits and auxiliary power supply and distribution

Lighting

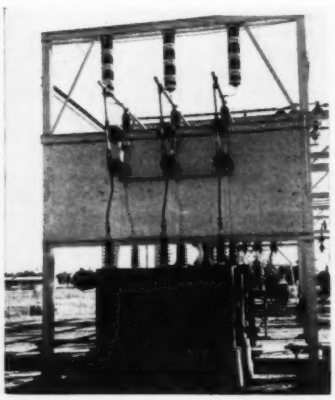
Lighting is generally incandescent in the turbine, boiler and auxiliary areas with high-level fluorescent provided in offices and control room. Emergency lighting is automatically transferred to the station battery in event of a-c failure. All lighting is served from new type 480-120/208-metal-enclosed dry-type transformer-regulator units to provide plus or minus 1% of nominal voltage. This is the first use of such a unit.

44-Kv Switchyard

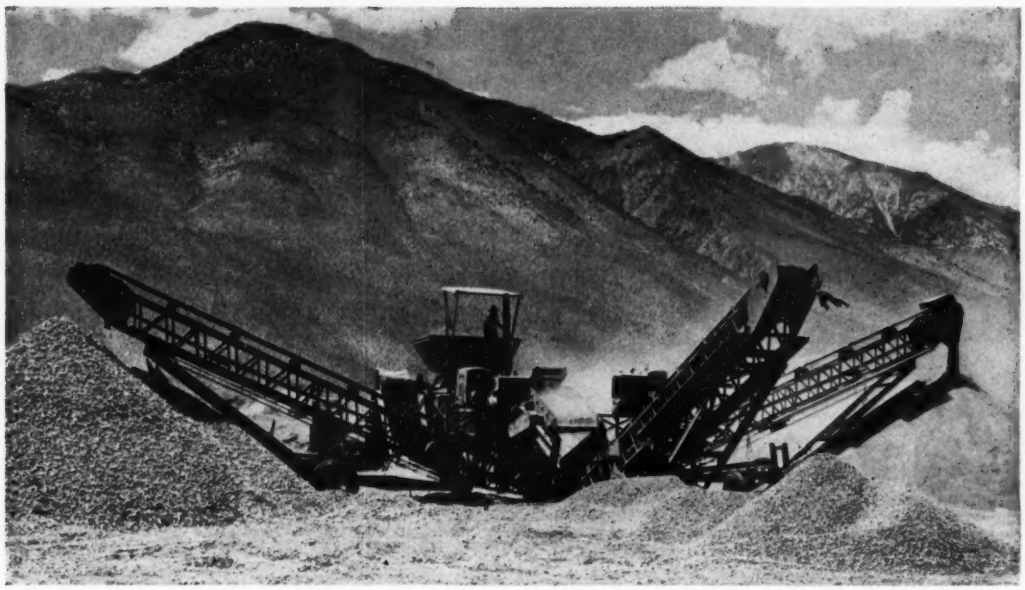
The units feed into separate sections of the 44-kv ring bus with the generator breakers located in the switchyard. All 44-kv breakers are controlled from the 44-kv control boards located in the plant control room. A single 12-conductor control cable from each breaker provides connections for control, metering and alarms, with single-shot reclosing, reparalleling carried out automatically.

Communication System

The communication system consists of a private automatic exchange switchboard with an executive priority and conference features, a public address system used both for paging and announcing, and a system of test jacks for intraplant communication of maintenance and testing crews.



44-kv cable terminal equipment (left) located in switchyard. Right: Dry-type package lighting unit containing induction regulator



Lack of transit-mix concrete suppliers along transmission line led L. A. Dept. of Water & Power to use portable aggregate plant

Field Aggregate Used for Tower Footings

J. F. Mariscal
Los Angeles Department of Water & Power

A portable aggregate plant proved an economical and practical solution to the problem of obtaining concrete for tower footings on the recently completed 230-kv Owens Gorge transmission line of the Los Angeles Department of Water & Power. In the 260-mile distance, investigation disclosed that there were very few suppliers who could furnish sufficient aggregate to conform with the construction schedule for the line. Moreover, hauling distances from these suppliers would have resulted in prohibitive costs.

It was decided, since there were a number of potential aggregate pits of satisfactory quality along the transmission line right-of-way, that such pits could be developed on an economical basis. Plans were prepared and purchase was made of a crushing and screening plant to produce approximately 220 cu yd of aggregate a day. Emphasis was placed upon portability, quick assembly and dismantling of the plant.

Cost of setting up the unit varied, but constantly decreased as the crews became more familiar with the operation of assembling and dismantling. Toward the latter part of the project, it was common to have all of the equipment in full operation only four hours after it had reached a new pit location. This crew normally consisted of three men, but for some pits a fourth man was required. Cost of moving equipment from pit - to - pit location was small because the plant was so designed and arranged that it was not necessary to disassemble any of the component parts. Three transit-mix trucks used on the job were capable of moving the equipment over rough roads and onto highways.

Capacity of the unit was contingent upon the type of material being processed, increasing proportionately with the percentage of sand in the pit. Under good operating conditions the plant would process around 50 cu yd (67 tons) of material an hour. Under the most adverse conditions encountered, capabilities dropped to 50% of this amount.

Actual labor cost of operating the unit was small. One plant operator, one helper and one loader operator were sufficient for normal operation, as previously mentioned. Regular maintenance was performed by a department service truck assigned to the whole project.

The aggregate plant was found to be extremely active on the job because of its economical operation and practically trouble-free operation. The scheme was an innovation developed by department construction forces. It obviated the problem of attempting to secure concrete aggregate through local suppliers who had neither the capacity nor the transportation equipment for the long distances involved over the 260-mile line. Upon completion of the line the plant further proved its usefulness in helping to supply aggregate for tunnel lining on the power plant end of the Owens Gorge project.

Aerial view of Lever Brothers $25 million ultramodern soap, detergent and edible fats plant for serving the growing industrial West

Soap Plant Uses Secondary Network

Three Power Distribution systems were considered for serving 9,700-kw load. Greater reliability favored a secondary network

Lever Brothers $25 million plant at Los Angeles, completed in June, was the largest major industrial plant built in the West during the past year. The new facilities will serve the 11 Western states with the well-known brands of soap, detergents and shortening made by the Lever Brothers Co. It is said to be the largest and most modern soap plant in the world and is the largest plant ever built in Los Angeles County. It is another example of a large industry establishing a Pacific Coast plant to serve better and more economically the growing industrial West. The plant consists of six major buildings and facilities occupying one-third of a 30-acre tract in the central manufacturing district eight miles east of downtown Los Angeles.

Electrical Distribution System

The electrical distribution system for the 9,700 kw of connected load in motors, lighting, heating and other applications was given careful study. Three systems were analyzed from the standpoint of first cost, continuity of service, maintenance, flexibility of operation and expansion capability to handle future loads. Systems considered were: (A) A 480-v secondary network consisting of six dry-type unit substations with a total capacity of 6,000 kva, (B) a 4,160-v primary selective radial system with seven units totaling 7,500 kva in capacity, and (C) a secondary selective radial system with seven double-ended units with total capacity of 8,000 kva.

Comparative Costs

First cost of the three systems ranged within 5%. Possibility of prolonged trouble on B, the primary selective radial system, the least expensive, ruled it out. System C, the secondary selective radial system, was ruled out, even though it was next lowest in cost, being 2% more than B, on the grounds that momentary interruptions of 3-5 seconds could occur before automatic restoration of service. C would have required time delay relays to prevent no-voltage release of motor starters. Systems B and C would require greater transformer capacity than A because unit substations would operate individually, and hence advantage could not be taken of the inherently good diversity in a plant of this type. This left A the logical choice.

Secondary Network Advantages

In the manufacture of soap, detergents and the processing of edible oils many operations are continuous and even a short interruption would prove costly. Continuity of service, therefore, was a primary consideration in leading to the choice of the secondary network. The system installed, as shown by the accompanying diagram, consists of 4,160-v radial primary circuits feeding six unit substations, each with a 1,000-kva 3-phase dry-type transformer. Each substation is a load center and serves radiating feeders in its area. In addition, 480-v circuits interconnect the six units to form a ring bus, or secondary network. This secondary network is protected at each substation by network protectors. In this way, all 480-v feeders are connected to the network so that connected loads are common to the system and all transformers feed all loads.

Service to the plant is provided by the Southern California Edison Co. over two 16-kv circuits on a preferred

Night view of modernistic entrance to Lever plant. At right are shown the large soap kettles. Lighting is by RLM incandescent units

and emergency basis with automatic throwover in the event of trouble on the preferred source. Two 16,500/4,160-v transformer banks feed the main 4,160-v board, from which feeders radiate at this voltage to the six unit substations. Studies indicated that the 15-minute plant demand would be about 4,500 kva and that power factor would range from 85% to 90%. With the 6,000 kva of installed transformer capacity, there will therefore be a reserve of 33%.

Ring Bus

The 480-v ring bus system is designed for the future addition of two more 1,000-kva unit substations. Provision is also made to add forced air cooling to the units at a later date to increase their capacity to 1,250 kva per unit, if found necessary.

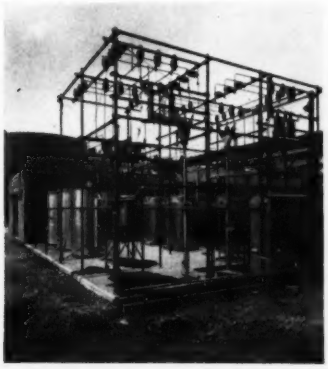
The inherently high short-circuit currents possible in a network system is a problem that must be met. High interrupting duty on circuit breakers was obviated in the Lever Brothers installation by the use of high impedance transformers. Transformers of 10% impedance instead of the usual 5% will limit short-circuit current to less than 50,000 amp in the ultimate 8-unit system. Use of standard 50,000-amp interrupting capacity circuit breakers was therefore made possible. Voltage regulation of the network is within 3% limits, even with the across-the-line starting of a 200-hp motor.

Design of the unit substations is interesting. Network protectors were provided in each of the two network connections from the transformers to isolate faults. Trouble will automatically disconnect the 4,160-v feeder, the transformer, or the tie breaker in the secondary network, all without interruption of service. Removal of any equipment for maintenance without shutdown is also possible. A ground detector at one of the unit stations was provided to indicate a ground fault anywhere on the system.

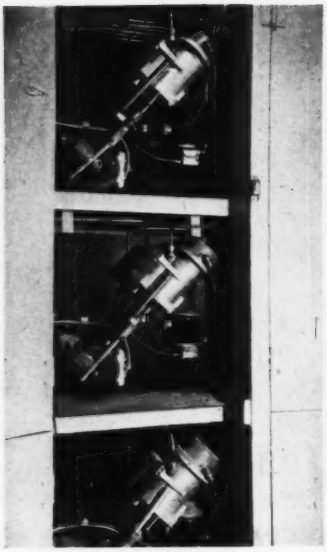
The system was designed by the Bechtel Corp. with the cooperation of the Westinghouse Electric Corp., supplier of the electrical equipment.

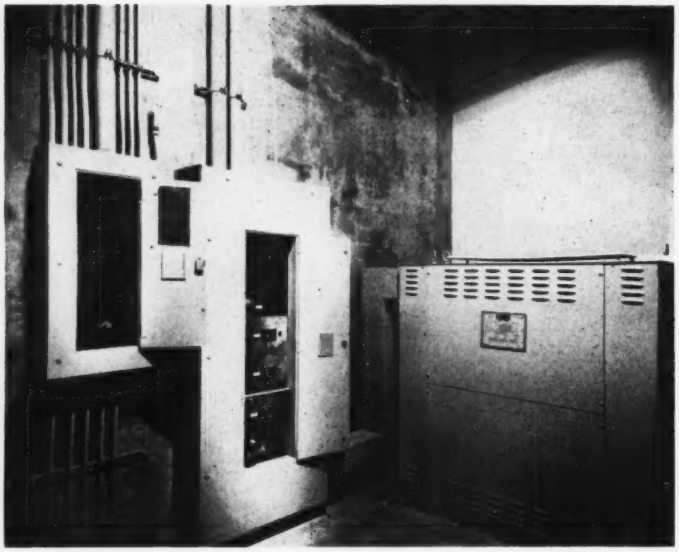
Lighting

Connected lighting load in the plant is 1,900 kw. Service is provided

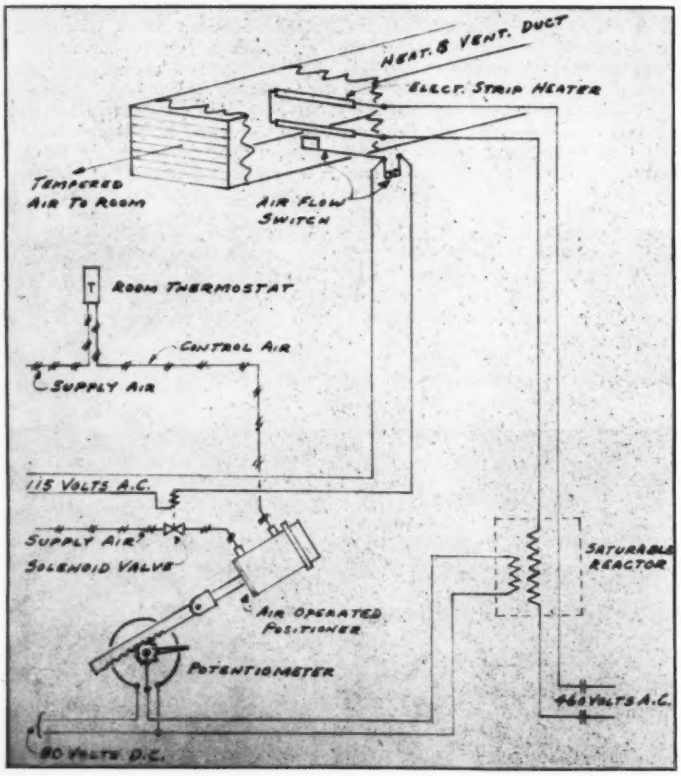


Power company's substation with preferred and emergency source feeds. Right: Typical storage area lighted with recessed fluorescent





Air-operated positioners (left) for potentiometers on booster electric air heaters. Right: Lighting load center of package type



Schematic diagram showing electric heaters in air duct and ingenious control system. Air-positioned rheostat varies the d-c voltage in the d-c winding of a saturable reactor

by 120/208-v 3-phase circuits fed from dry-type transformers served from the 480-v secondary network above described. Lighting transformer sizes range from 100 kva to 300 kva, three phase.

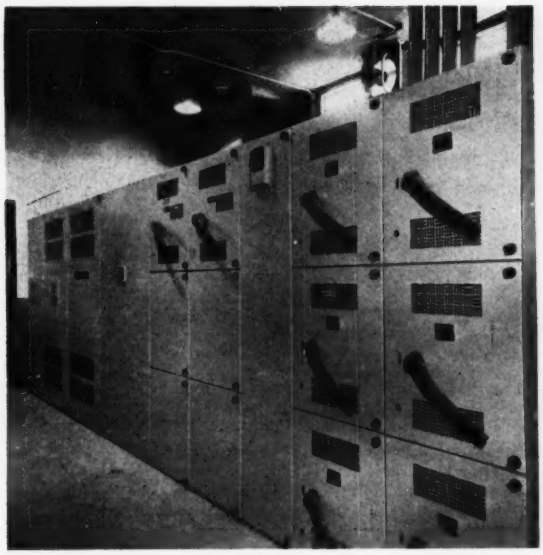
In general, the lighting installation consists of commercial-type fluorescent fixtures in the office and laboratory building, industrial fluorescent in the critical seeing areas of the processing and manufacturing portions, and industrial incandescent in the remaining areas.

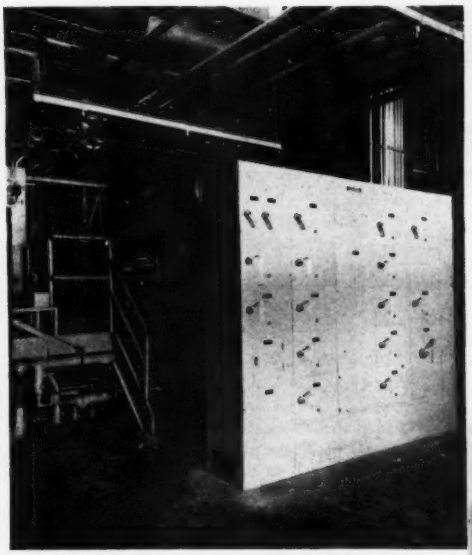
Recessed fluorescent fixtures with high-efficiency, low-brightness diffusing glass covers were provided in the office areas. Intensities range from 40 to 50 f-c in the important areas.

Industrial Units

Dust-tight RLM industrial fluorescent lighting of 25 to 30 f-c was provided in the packaging and packing areas of the manufacturing plant. Dust-tight industrial incandescent fixtures provide 12 to 15 f-c of general illumination elsewhere in the finishing operations. In addition, local lighting provides high-intensity illumination at critical locations. Incandescent RLM fixtures provide about 10 f-c of illumination in the storage areas.

Because of the presence of water, oils and other liquids, vapor-tight incandescent fixtures were provided in the processing areas. These areas include the refining and processing of the oils used in the manufacture of





Load center (left) contains 6,000-kva dry-type transformer, breaker panels for 4,160- and 480-v circuits. Right: 480-v power board

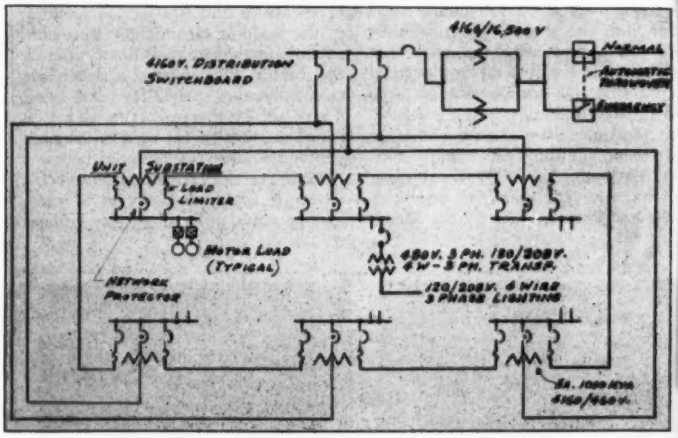
the various products. In addition, local lighting was provided at critical areas for specific requirements.

Electric Heaters at Air Outlets

Another distinctive feature of the plant is the use of electric heaters at the outlets in the single-duct air conditioning system. These automatically controlled heaters of 2- to 6-kw capacity are an innovation in air conditioning systems and were installed to overcome the disadvantages of the lower-cost single-duct air conditioning system. The heaters permit satisfactory balance of heat distribution to various zones in the plant, since a local change has no effect on the over-all system.

In the conventional single-duct system variable louvers or dampers may be used at duct outlets with some degree of satisfaction. This is not entirely satisfactory, however, because a change of adjustment at one outlet alters the air volume entering that zone, and affects as well the amount of air entering other zones. The Lever Brothers installation deviates from ordinary systems in that no dampers or louvers are used to vary the air flow. Instead, electric heaters, each controlled by a saturable core reactor, are used. The reactors are controlled by a thermostat installed just ahead of each duct outlet. The system is shown schematically in one of the accompanying diagrams.

Each heater thermostat functions pneumatically by means of the plant air system to vary the setting of an air cylinder, which in turn is linked by a rack and pinion gear to vary the setting of a plate-type rheostat. The rheostat is connected in series with a d-c supply to the d-c winding of a saturable reactor designed for 1% minimum power. Thus a stepless control furnishes auxiliary heat ranging from 1% to approximately 95% of the heater rating. The d-c supply for the saturable reactor control is obtained from a selenium rectifier. Interlocking is provided so that the entire system is energized only when the air conditioning equipment is in operation. Electric heaters were chosen for the auxiliary heat in preference to steam or gas because of lower initial cost, lower expected maintenance and ease of control.



Schematic showing electrical distribution system with secondary network at Lever plant

This brief account of the electrical system and equipment in the Lever Brothers plant has brought out several new features in industrial plant design that no doubt will find further applications on the West Coast. The plant is a credit to the designer, the Bechtel Corp., and especially to W. H. Hahn, chief project engineer of the industrial division of that corporation.

120/208 System Saves 20% Copper

in large apartment installations

Ione Plaza Apt. building in Portland . . .

Where the size of the building, either vertically or horizontally, is such that it proves desirable, distribution at 120/208, three phase, four wire, can save as much as 20% of the copper that would be required in a single-phase system. B. A. Travis, electrical engineer, Seattle, reasoned so to a panel at the Northwest War Production Conference in Seattle in 1944, when copper conservation was a vital need then.

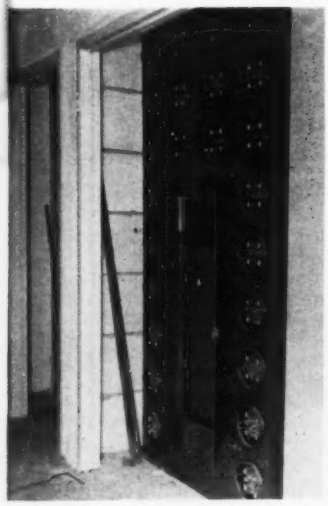
Higher voltage distribution has come into use since then for industrial plants and office buildings, but only recently has it been employed in such residential occupancies as large apartment buildings. In Portland, Ore., however, several new and large apartment buildings are being constructed with 120/208 distribution. Among these, perhaps the largest is the Ione Plaza at Park and Montgomery streets, a 14-story and penthouse concrete structure occupying the entire block.

The architects are Victor N. Jones & Associates of Seattle; Beverly Travis is the electrical engineer, and Emory & Bohm Electric Co. of Portland, the electrical contractors, E. J. Bohm personally supervising the job.

In his design Travis chose to place a load center in the basement at the center of the building and feed to the floors above and the service facilities of the building, from there by means of low-impedance bus duct, tapping the duct at each floor at a meter and circuit breaker panel for that floor. There are 24 apartments to each typical floor. Bus duct is used to take advantage of diversity between floors.

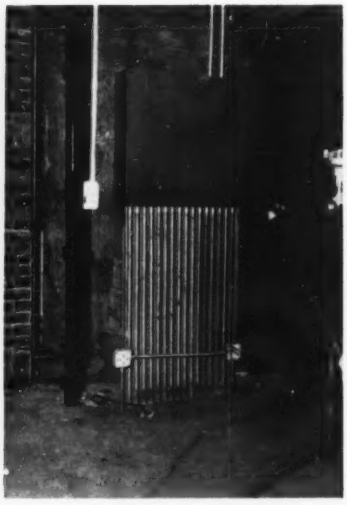
Main service comes from Pacific Power & Light at 11 kv to a transformer vault with three single-phase transformers, connected delta-wye to deliver 120/208 v, to a 4-wire low-impedance bus of 4,000-amp capacity. Primary switchgear is General Electric, metal clad, with 15-kv, 3-pole, single-throw, 150,000-kva interrupting capacity, d-c solenoid operated, a-c trip and close, with standard accessories.

The main distribution board consists of one 200-amp circuit breaker for the emergency main; a 1,350-amp breaker for the bus duct feeding floors 2 to 5; a 1,650-amp breaker for the bus duct feeding floors 6 to 14, including the penthouse, and a 1,200-amp breaker for the subfeed for the building's utilities—kitchen, elevator,

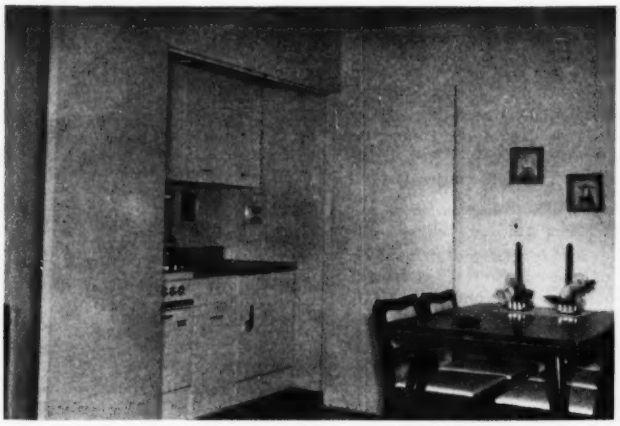


Meters and main circuit breaker for each apartment on each floor, bus duct at rear

Main distribution board with circuit breakers for the bus-duct risers to floors above



Panel in the penthouse for the Antennaplex system for both radio and future TV service



. . . provides each unit with an electric kitchen, circuit breaker panel, and each bathroom has an inset wall-type electric heater

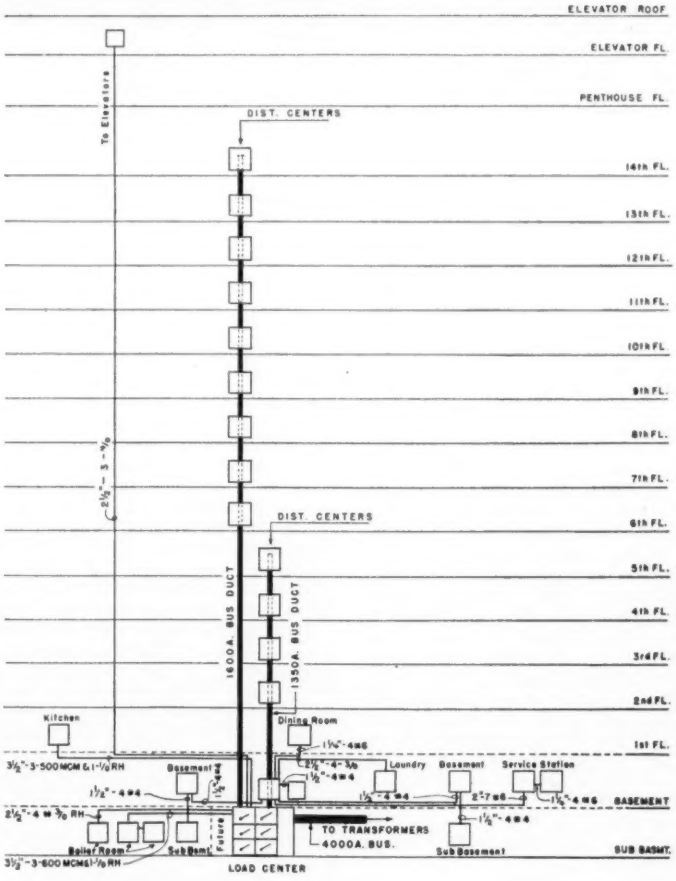
boiler room, etc.

At each apartment floor feed is tapped off the Trumbull low-impedance bus through a tap box and into the rear of the meter and breaker panel. There is one main breaker for the floor, then a main for each apartment, ahead of the meter. Each apartment has a small panel with five breakers, one for the range, one the bathroom heater, one appliance and two lighting circuits. The panel is located near the range.

Other systems installed by the contractor included a radio and TV antenna system with an outlet in each apartment; a fire alarm system, an intercommunicating telephone system, and a system of floor phones by which tenants can call for service from the garage, office, restaurant, valet, etc. The basement floors contain a garage and service station; the first floor a restaurant and office.

It was in this building, with its 2-in. walls that Emory & Bohm devised the method of holding the outlet boxes to the metal lath by piercing the box with a short metal rod that was tied to the lath, and after plastering the rod cut off inside the box. This was erroneously ascribed to the Ridpath Hotel installation in last month's issue. The floor too was so thin that there was no room for pipe bends and so, where the contractor came to a group of outlets, he ran his conduit to a gutter from which taps were run up as required. Kitchen panels were deeper than the wall and had to be concealed by a widened wall section.

All ranges were equipped with elements wired for the 208 voltage by General Electric Co.



Note:
FEEDERS TO APARTMENT PANELS ARE 1"-3 W& EXCEPT PENTHOUSE APTS. WHICH ARE 1¼"-3 W&

POWER RISER DIAGRAM

How To Buy Copper Wire

Digest of orders made by Biddle Trade Bureau

Q. How does an electrical contractor get wire to connect an electric range, clothes dryer, refrigerator, or similar appliance in a residence? or, to replace his inventory for wire used on such an installation?

A. His customer, the owner, should authorize him to use a rating U-7½ This rating would be good for up to 17½ lb of copper. At the same time the contractor may use a rating "DO-U7" to buy the other material needed to do the job.

Such an installation is an addition or alteration to the residence and qualifies for one-half the amount of copper allowed new construction under Direction No. 1 to CMP Reg. 6.

Q. What rating would be used if a job were to connect a refrigerator or other appliance in a restaurant or similar commercial establishment instead of a residence?

A. The symbol U-8 would be used instead of U-7. A commercial establishment may use the U-8 symbol to buy up to 200 lb of copper per project per quarter. In all cases the allotment covers only the actual quantity needed to do the job and the maximum of 200 lb of copper may not be purchased on the rating unless that much is used.

If the commercial establishment is of a type that comes within the definition of an "industrial" establishment, then the symbol would be U-6. An industrial may use the U-6 symbol to buy up to 2,000 lb of copper per project per quarter.

In either case a rating "DO-U6" or "DO-U8," respectively, is used to buy the other kinds of material needed.

If they prefer, the commercial establishment or industrial plant may also use the MRO rating for such an installation, provided the total cost to them is less than $750. Total cost includes cost of appliance and other expenses as well as the electrical work. This is possible as the establishment is allowed to use the MRO symbol for minor capital additions up to $750, provided, however, that such must then be charged to their overall MRO quota, as defined in CMP Reg. 5.

Use of the MRO symbol is not allowed by residences.

Q. If a residence cannot use the MRO rating, how does an electrical contractor get wire to repair a short circuit in a residence?

A. By using the symbol "RE."

Q. Does the contractor automatically use the U-6, U-7 or U-8 symbol whenever he does a job of a type covered by one of those symbols?

A. No. He must be authorized by the owner, or prime contractor, to use the rating. See CMP Reg. 6 for definition of a "prime contractor."

Q. Must this authorization be in any specified form?

A. No. We suggest a statement be placed on the contractor order form something like the following: "Authorization is hereby given to use the CMP symbol (U-6, U-7, or U-8) to purchase such material as is necessary to do the work covered by this order within the limitation set forth in CMP Reg. 6, Direction No. 1." This should be signed by the owner or prime contractor.

Q. May an electrical contractor automatically use the MRO rating of his customer?

A. No. He should receive some authorization similar to the above. We suggest something along the following line: "Authorization is hereby given to use the CMP symbol MRO to purchase such material as is necessary to do the work covered by this order, pursuant to the provisions of CMP Reg. 5."

Q. May a contractor use either the "U" symbols or MRO to buy material to put in his stock so as to have it ready for a job which he gets later?

A. No. The rating may be used only to purchase material which will be used on a specific job or to replace inventory for material which has previously been used on such a job. The "RE" symbol, under CMP Reg. 7, is the only procedure which allows a contractor to purchase material for inventory in advance of a specific job. There are definite limitations upon the quantities that may be bought.

Information reaching us indicates that many are of the impression that the "U" symbols replaced MRO. This is incorrect. The MRO regulation has not been changed. The "U" symbols apply only to new construction, new installations, remodeling, and additions, while MRO applies to the maintenance and repair of existing installations.

Correcting Safety Order Interpertations

In reviewing the differences between the California Electrical Safety Orders and the National Electrical Code (see August 1951 issue, p. 83-5), a few errors or misinterpretations were made. Some were minor, but there was at least one that it is important to correct.

Recognition is made of the high-voltage fused load-break switch (like S&C and Westinghouse) in 2335-b-2D for services to transformers. However a switch is required in either the primary or secondary if a high-voltage cutout is used that is not designed for opening under load. This new rule permits the use of the high-voltage fused load-interrupter switch, not previously permitted under the old orders.

As for 2398, evidently 2398-e-1 and 2 were combined. This order relates to location of the motor controller; 2398-e-1 calls for the controller or its disconnecting means being capable of being locked in the open position; 2398-e-2 says that a manually operable switch, which will prevent the starting of the motor, if placed within sight of and not more than 50 ft from the motor location (and this switch may be placed in the remote-control circuit of a remote-control type of switch) will be considered to be acceptable under the rule that a motor and its driven machinery shall be within sight of the controller.

In the note regarding 2330-b-1, that a single set of service entrance conductors may be run to more than one individual service switch if grouped near the entrance, provided that each switch shall control the entire current carried by one individual service of the group, it was said that not more than one service could be for the same consumer. This was not true. Not more than one service of this group *of the same class* may be for the same consumer.

As to working space and guarding, in Article 18 it was stated that it calls for separation of high-potential equipment. What was intended was to say "from low voltage" by partitions or screens.

The controversial wire tables are to be reconsidered again. A rehearing has been scheduled in Los Angeles, Oct. 30, at the State Building, to consider Article 38, Table 1, as well as a few other points not considered satisfactory. Among these are 2330-d; 2335-b-2-c; 2361 (temporary power); 2383-a; 2406-c-3; 2412-g (height of switch); 2475 (8-ft clearance); 2489-a (bare crane conductors); 2514-c-2 and 2515 (hazardous locations); and 2569-b-3 (interlock on doors of fused cutout enclosures on high voltage).

ELECTRICAL WEST Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

Round six of the battle between wages and inflation is in its preliminaries. San Francisco's IBEW Local 6 has formally asked for a 25c an hour raise to $3 an hour, Jan. 1, 1952, offering to protect contracts signed prior to Oct. 27. This will upset the generally stabilized scale of $2.75 now prevalent in California and involve NECA chapters everywhere in reopened negotiations despite agreements supposed to run until June. Preparing for this several union locals have talked of welfare plans and fringes to soften up contractors to swallow a straight dose of wage increase in order to avoid the tangled bookkeeping among the fringes. — **Guess who wins**

Copper, despite whatever gossip or wishful thinking you may hear, is really getting no better fast. There is a lot of it hoarded, no doubt, by contractors who stocked up for future insurance, but even this supply is dwindling as the demand increases. The danger in trying to evade the rules is that if these don't work, even worse ones may be thought up—such as putting **all** construction under a rigid permit system, with more red tape and less and less profit. — **Squeeze gets tighter**

Charles Langlais, San Francisco contractor who sat in on a session of Construction Industry Advisory committee of NPA, told that they learned there just isn't enough copper to go around. Getting any in this last quarter is tough. For the first quarter next year and even into the second, it will be tougher still, with no sign of ease-up until the third or fourth quarter next year—if the cold war doesn't get really hot. — **Worse before better**

Galvanized pipe and wire reflects the increased price of zinc, says a release from U. S. Steel. All products using zinc galvanizing will be affected in advances being made according to a formula approved by ESA. — **Zinc's up**

Motor shops now find that OPS has put sales of used machine tools under a new separate ceiling price regulation 80. It also amended CPR 30 to provide a new method of computing materials cost adjustments for machinery and related manufactured goods. — **Used pricing**

Simplification and standardization of lines will be given strong pressure by NPA as a means of conserving materials under shortage of supply. This may soon result in less varieties and concentration on fewer types. At the Electrical Contractors Industry Advisory committee meeting with NPA in Washington, the contractors urged that rather than code minimums they advocate fewer wire sizes, fewer types of insulation, simplified designs of fittings, devices and switching and protective equipment. So look for manufacturers to be ordered to do just that and for supplies of varieties to dwindle, requiring substitutions in many future jobs. — **Better answer**

Denver will have an Armed Forces Small Business Exhibit at the University of Denver Arena, Nov. 13-15, at which products that can be subcontracted will be shown to those interested in getting such contracts. — **Parts fair**

Scrap metal not in use or usable should be moved into scrap channels as soon as possible. Many a contractor's shop has a big accumulation of old stuff kept in the vague hope that it will be usable somewhere sometime. Look back and think how seldom that happens and clean out the scrap. — **Clean shop**

Leo H. Lipscomb, general sales manager of BullDog Electric Products, who visited with the Western switchboard manufacturers using BullDog equipment, brought news that the company is simplifying its entire line, with a reduction from 238 to 38 catalog numbers, and will concentrate on Type A switches entirely, selling them at Type C prices as a result. — **Reduces types**

Deadline for submitting entries in the Fourth International Lighting Exposition and Conference $2,500 Merit Award Competition is Dec. 31. Owners, contractors, utility lighting, distributors, architects and engineers are eligible. Get details from 326 W. Madison St., R. 818, Chicago 6. — **Entries soon**

Father's amendments

First Taft-Hartley amendment wasn't the one desired by the construction industry. That one comes up at the next session. What was amended was that union contracts can include certain compulsory membership provisions if contracts already include union security clauses. That one to make elections unnecessary in the building industry is still to be passed. Both were sponsored by Senator Taft, however.

UL news

V. H. Hansen has been transferred to the San Francisco laboratories of Underwriters' from the Chicago laboratories. He is a division engineer in the electrical department. Other UL news is that Everett E. Carlton, supervising electrical safety engineer, California Division of Industrial Safety, has been appointed on the electrical council and made an associate member of Underwriters' Laboratories Inc.

Spots

Andreassen & Co. Inc. of 105 Front St., San Francisco, has USA distribution for the line of Luxo 1001 adjustable, counterbalanced supplementary work lights, using a 60-w lamp, especially useful in industrials.

Farmer training

Demonstrating good wiring and motor practices for the farmstead is made easier by a guide developed by the Farm Utilization Committee of Edison Electric Institute. It is designed for use with vocational agricultural schools, 4-H clubs, farm meetings. Contains 57 pages in mimeographed form, six charts. Sells at 50c from EEI, 420 Lexington Ave., New York 17.

Revive exchange

A new Builders Exchange for Los Angeles is being formed, sponsored by the California State Builders Exchange, the California Council of Architects, and subcontracting organizations, among them the Los Angeles Chapter of NECA. Bill Wright, who has served in Bakersfield association, has been made manager of the new exchange. One of the projects contemplated is a plans room service, originated by the architects. Another project being considered is a central bid depository and a correlation of information services among trade associations.

New slate

New officers were elected by the Central Valley Chapter of NECA and its manager, C. R. Walker, resigned at a meeting late in October. Virgil Hodges became president, Frank Orr, vice-president, and Alton Phillips secretary-treasurer, and a new board will select another manager soon.

Field coverage

William E. Blackmar Jr., manager of the Montana Chapter of NECA, will do field work in District 8 on the basis of about a week a month, under a new arrangement announced by Matt Sherwood, Western region director, on his return from the convention and a trip to Montana. District 8 comprises the states of Colorado, Wyoming, Montana, Idaho and Utah.

Usable items

Interesting new things announced by manufacturers for contractor use include: Westinghouse has a new farm motor starter for across-the-line starting of single-phase motors, sizes up to 7½ hp, called Farmstarters . . . Murray offers a new versatile load center panel with 20 magnetic breakers, which makes opposite polarity available on adjacent positions by a bus arrangement so it can be used for 10 2-pole circuits or 20 single . . . Hilco Engineering helps solve how to affix boxes to plasterboard, plywood or celotex materials. It has some aluminum brackets with a prong that sinks into the board and grips it. The brackets support the box . . . Ford Products makes a "Dowser Ball" gimmick by which you can locate the studs in the wall behind plaster or wall board.

For low ceilings

Lightolier announces a new type of sculpted Petrastone ceiling fixtures for low-ceiling modern houses. They may be painted to match the trim. An inner polished reflector eliminates the need for white reflecting ceiling and so the unit may be used with dark ceilings. It comes with or without a center "Colouvered" lens.

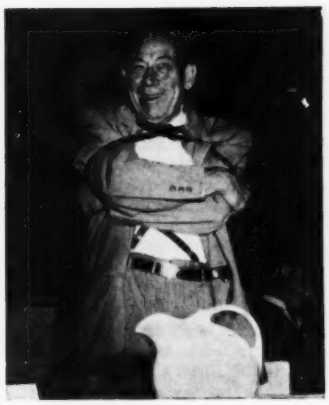
No give on price line

OPS, meanwhile, has not granted any price relief even to cover wages that have been forced up. There are still promises of a construction price regulation, this time by Nov. 1, but don't hold your breath waiting. It is said by those who have seen preliminary drafts to permit actual cost increases even if not percentages for overhead and profit on them.

Gets off the lid

Eric Johnston, the word is, quits the bureauacracy to go back to running the moving picture industry and his Spokane enterprises, Columbia Electric and Brown-Johnston, and Charles Wilson, ex-G-E, may take over the wage control himself, feeling that Johnston let labor punch holes through the ceilings. Big Steel is getting ready to lead the parade with a new lid blowing on wages. Get set for lots of labor pains in January.

Holloway Hoffman Mattison Scaife Chamberlain



Late "Red Suspender" Sam Vining

When Dealers Faced the Facts

Appliance dealers in southern California met the beginning of the fall and winter selling season with two regional conferences that brought them the opportunity to hear experts from outside advise them on management and merchandising practices, and the chance to use the dealer round-table idea to develop ideas and principles of ethical retail practices.

The annual fall conferences of the Bureau of Home Appliances of San Diego County and the Electric League of Los Angeles, on Sept. 25 and 27, respectively, coming as they did during a profitable upswing in the local appliance and television markets nevertheless drew satisfactory attendance and continued interest in the retail problems of effective salesmanship, profitable management, sales training, and market expansion.

San Diegans Hear How To Operate Profitably

Highlight on the program of the San Diego Bureau was the talk of E. A. Mattison, executive vice-president of the Bank of America and originator of that concern's famous "Timeplan" method of financing retail sales. He pointed out in his address on "The Successful Management of a Retail Business" that "good management in the retail field . . . is nothing more than the use of common sense in these six fields: (1) Planning; (2) merchandising; (3) operations; (4) promotion; (5) selling; (6) finances."

He emphasized "planning" because he has observed that "the small business field is still filled with too many aimless drifters who operate by hunch or the crystal ball far more than they should." Planning, he said, covers the basic decisions that the dealer makes when he starts out, and which he chceks and rechecks constantly to see that he is still headed in the direction in which he wants to go.

Merchandising, as Mattison referred to it, is "nothing more than selling the right goods, at the right time, at the right price." Admitting that it sounds easier than it practices, he added these pointers to merchandising—planning for the market area and the type of customers the dealer intends to serve enables him to stock "the right goods"—a sound retail practice of "peaking your stocks for high-selling periods, and coasting through the slack periods" helps having the right goods "at the right time"—avoiding extensive and unplanned price cutting is a help toward the necessity of selling "at the right price."

Under operations, the things a dealer does to keep his business as efficient as possible make up the quality required for successful store management, said Mattison. They cover storekeeping, personnel management, service, and as good operations they "are nothing more than keeping a happy crew, a clean floor and a closed backdoor."

Under "promotion," he included advertising, display and selling, pointing out that dealers must not only use the manufacturers' national advertising, point of sale displays, training programs and consumer material, but must "personalize it and individualize it." ". . . You should think in terms of your 'business personality' and then style your promotions accordingly . . . expressing it in the appearance of your store, trucks, advertisements, and by the pleasant manner of your service men, salesmen, and other employees . . . create some 'plus values' that the public will learn to recognize and appreciate, and there is no better place for these extra touches than in your promotion program."

Finance, Mattison's final point, should not be associated only with bookkeeping, he said. Successful financial management for the retail appliance dealer includes "financial planning . . . where you set up your budgets and seasonal plans. It means analyzing your sales, purchases, turnover (over-all, departmental, and by major items or lines), gross margin, and operating expenses in advance so that you will operate above the break-even point and end up with a net profit out of which you can pay your capital loans, your taxes, and still have something left to take home." He advised a monthly profit and loss statement broken down by percentage

as well as dollars, as necessary for successful management.

A panel of five manufacturers' representatives was on the San Diego conference program to discuss current outlooks in the appliance and TV fields.

Charles E. Moore, Pacific Coast manager of Sunbeam Inc., reported on recent activity in enforcing the fair trade laws, and stated that Sunbeam will continue to make every effort to keep its products sold at suggested retail prices.

John J. Pollon, vice-president of the Amana Corp., reviewed trends in the freezer field, pointing out that in 1951 for the first time, home freezer sales will top the one million mark, and that sales were now running four to one, refrigerators to freezers.

Howard Scaife, Pacific Coast manager of Hotpoint Inc., said that the increasing acceptance of electric kitchen and laundry equipment, plus the restrictions on raw materials, would create a 1952 situation in which production will be less than sales.

Seward Abbot, Pacific Coast manager of Servel Inc., also stated that shortages are just around the corner. With that in mind he advised dealers to build a better relationship with their customers.

Fred Fenton, Pacific Coast manager of Easy Washing Machine Corp., however, told the dealers that there will be plenty of washers to sell in 1952 and that they should look again toward the opportunities in the trade-in market.

On the San Diego program was A. E. Holloway, president of the San Diego Gas & Electric Co., who welcomed dealers and their guests and presented a report on electric progress in the county. He showed that in the first nine months of 1951, his company had installed 22,206 new meters, compared with 11,900 for the same period of 1950. He said that the electric send out is running 22% ahead of 1950.

Paul DuPont and **Frosty Raymond** presented a graphic picture of the way the bureau was helping promote the sales of appliances and television through its month-to-month campaigns. Bill Marsden and Dan Turner showed the progress being made in the bureau's sales training programs.

The closing speaker on the fall conference was Vernon E. "Sam" Vining of Westinghouse Electric Corp., Mansfield, Ohio, who gave an inspirational and graphic talk on "Selling Is Fun."

Harry E. Callaway of Thearle Music Co., was chairman of the fall conference committee. Gordon Dawson, president of the bureau, presided. Arrangements were coordinated by J. Clark Chamberlain, secretary-manager of the bureau.

Reis Moore Thomas Gilmore Sauer

Cornfeld Cockfield Holland Davis Zillgut

Hellman Vining Hargrove Logan Chamberlain

Dealer Clinic Studies Los Angeles Retailing Problems

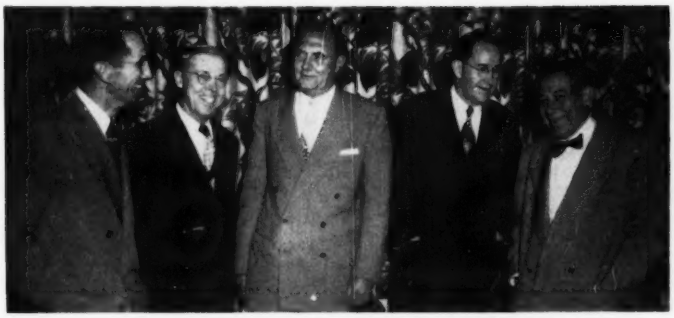
In Los Angeles on Sept. 27, the Electric League held two sessions, one in the afternoon as a "retailers' clinic" and a more formal one in the evening to discuss league business and hear guest speakers.

Clinic—With J. Clark Chamberlain, secretary-manager of the San Diego Bureau of Home Appliances, as moderator, a small gathering of dealers considered the "gripes" which had been compiled from 1,500 questionnaires mailed by the Los Angeles League to retailers in that area. These dealer complaints divided into seven groups:

1. **Franchised merchandise** is available from too many sources.
2. **Too many retail outlets** for major brands.
3. **Untruthful advertising.**
4. **Distributors selling** contractors direct.
5. **Distributors selling** the retail customer direct.
6. **Low discounts.**
7. **No standard rule** of qualification for a franchised dealer.

Speakers at the afternoon session covered operational problems.

Profits—An analysis of "your costs and how to govern them" by Forrest



A few moments before he was stricken this picture of V. E. Vining (right) was taken. He was to have addressed a salesmen's appreciation dinner of the Bakersfield TV-Appliance Dealers Assn. With him were Bill Wyatt, association secrtary; Dave Urner, president; Jack Hall, So. Cal. Gas Co., and H. H. Kelly Courtright. PG and E manager

Denning, vice-president of the California Bank, compared profit and loss statements of a profitable dealer operation and an unprofitable operation. He pointed out that "the gross margin was the same . . . control of operating costs is what makes the difference between a profit and a loss."

Truth—Robert Sample, Better Business Bureau of Los Angeles, talked on "How We Can Bring About Truth in Advertising," with particular reference to the television retailing field. He did not believe that new laws (referring to the present attempt to license Los Angeles TV servicemen) were the answer to better business ethics. "We have enough laws on the books now to take care of the situation, if the industry is really sincere about cleaning it up." He urged distributors and manufacturers to quit talking out of both sides of their mouths.

New Retailer's Division—The chairman of the afternoon session, Willard Hellman, outlined the objectives of the newly formed Retailer's Division of the Los Angeles Electric League:

1. **To eliminate disgraceful** types of misleading advertising.
2. **To clarify** a retail dealer, what are his responsibilities and obligations.
3. **That merchandise should be sold** only through franchised dealers.
4. **To campaign** to educate the public to buy from legitimate, franchised dealers.
5. **To promote** adequate wiring and change obsolete codes.
6. **To establish a screening program** for sales and service personnel.
7. **To provide a service** where dealers may register surplus goods.
8. **To establish a code of ethics** for the industry.
9. **To promote** and set up monthly meetings for specific brand dealers.

The evening, "banquet session" was presided over by Glen Logan, managing director of the league, who read an amendment to the by-laws creating a retail dealers' division to include the retail and service members of the league. The amendment was passed, and plans were made to get a special representative for the dealers to work on the staff under the managing director.

The 300 dealers, distributors and guests who attended the banquet meeting heard an inspiring talk by Vernon E. "Sam" Vining. None realized as the applause rang long and loud after his close, that they had heard the last of the great speeches by "the man with the red suspenders." Before he could speak the next evening in Bakersfield, the great salesman was stricken fatally.

The West was well represented at the 16th annual conference of the International Association of Electrical Leagues at New Orleans, Oct. 10-13. Ralph Hubbard, manager, Rocky Mountain Electrical League, was elected vice-president, and R. L. Halverson, manager, Intermountain Electric Assn., Salt Lake City, governor for Division 4; Richard Hall, Electric Service League of B. C., Vancouver, of Division 5. Those in attendance from the West included George Cain, secretary, Sacramento Valley Electric League; Victor Hartley, manager, Pacific Coast Electrical Assn.; Glen Logan, manager, Los Angeles Electric League; Jack Canady, Appliance Merchandisers Assn. of Phoenix; LeRoy H. Bennett, manager, Northern California Electric Bureau, San Francisco; and J. Clark Chamberlain, manager, Bureau of Home Appliances of San Diego County, who suggests a Western meeting soon.

Lamp Promotion

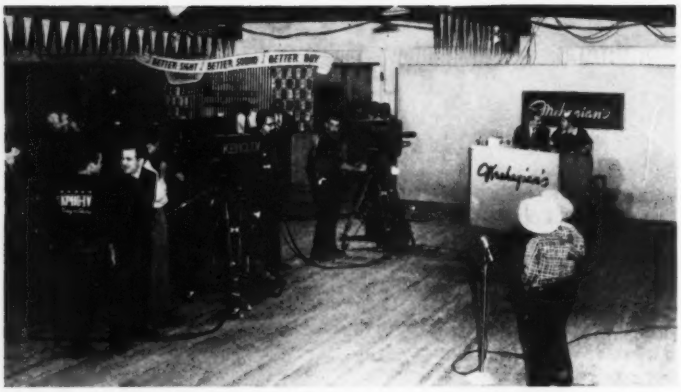
CLM floor and table lamps and some light conditioning equipment are being sold to residential and farm customers of Washington Water Power Co. in an effort to bring domestic revenues back into balance and at the same time develop prospects for dealers for the sale of major appliances. The very limited merchandising program is offered to any of its divisions that wishes to conduct such an activity, using either the residential representatives or outside residential salesmen.

Lighting is one field of selling on which nobody seems to be doing any educational work and lighting revenues have suffered from this neglect. The company feels that a return of educational sales effort to domestic lighting will reawaken a dormant market that dealers can follow up on but for which they may not now have an incentive to develop themselves.

Those divisions desiring to engage in a selling program featuring CLM portable lamps and light conditioned homes have available to them complete ordering and pricing information. No items are to be sold except those approved by the general business development department. Nor will direct sales be made for dealers. However, finding of sales prospects for the dealers is definitely a part of the company's operations. The home lighting equipment will be offered on credit terms and prices meeting the industry's highest standards as well as conforming to OPS and FRB regulations.

The program was begun in September and is being conducted in its entirety in two divisions and partially in two others. The results so far have been very satisfactory. Not only has the company sold a reasonable number of lamps, but several dealers have stocked or are stocking certified lamps and the quality of lamps shown by the dealers is definitely improving.

Sacramento Valley Electric League heard A. A. Nerling of Graybar show it how to sell an electric range; Anne Terk, SMUD home economist, explain the housewife's likes and dislikes of an electric range and how to meet them; and George L. Cane, secretary, report what he had found out at the IAEL conference. The film, *Ingredient X* climaxed the Oct. 22 four star studded program. Cain reviewed two papers from IAEL, one on marketing, one on NPA's affects.



Public watches one of the dealer presentations at recent Television Show in Phoenix

Salesman Pitch Over TV

One sure way to get salesmen to perfect a demonstration technique was found by the Appliance Merchandisers Assn. of Phoenix. Put them on TV in a contest to be judged by the public

This is what the committee headed by Rene Larriva, Crosley distributor, decided and they gave Jack Canady, AMA manager, the job of writing the script. What jelled was a five-minute package, *The AMA Cold Club*, which the local TV station, KPHO-TV, put on between 5:55 and 6:00 p.m. five days a week during the AMA refrigeration promotion.

Five dollars was added to the cost of station time to make up a pool for the competing salesmen. As it turned out there were 26 spots during the month and the salesmen split $130 in three prizes. The salesmen gave a five-minute demonstration and were judged by the viewers, who delivered ballots, on which they voted for the salesmen they selected, to one of the dealer stores. A total of 250 ballots was turned back to the dealers, considered excellent in view of the trouble viewers were put to in order to vote. "One thing is dead sure," said Canady, "Our 20,000 video set owners saw and heard one helluva lot about the new refers."

AMA drew attention to the contest by newspaper ads. The public was urged to watch the salesmen demonstrate a refrigerator and take a card in to a dealer telling in 25 words why they liked such and such a salesman's pitch. Prizes were awarded those who did. Then the salesman who got the most votes won the salesman's prize. Cost of the promotion was divided among participants at a cost of about $23.75 per performance.

Following the refrigeration promotion came the Television Show, with Leo Middleton, City Radio, as chairman. It climaxed in the second annual TV Exposition in late September. The show was held at the Rollerdrome where 20,000 visited during the three days to see 11 live broadcasts by KPHO-TV. Advertising included newspapers, TV and bus cards; $1,500 worth of prizes were offered, among them three TV receivers. For the opening day 10,000 attended, including 3,000 small fry, to see Ralph Byrd (Dick Tracy) perform.

Sales goal was for 2,000 sets during September and October, which would raise the existing total of 20,000 sets by 17 to 19%.

Exhibits were limited to distributors and exclusive franchise holders, and included Admiral, Crosley, DuMont, Capehart, Emerson, Hallicrafters, Hoffman, Magnavox, Motorola, Packard-Bell, Philco, Sparton, Sylvania, Westinghouse and Zenith.

Canady has been asked by dealers and utility in Albuquerque to come over there and help them set up a promotional association similar to AMA for that region.

Monthly programs of promotion are scheduled by AMA for the entire year, but the next major event will probably be to feature electrical gifts for Christmas, in which everything in the book will be given a play. Plans for this had not yet been announced at press time.

NASA

First meeting of its kind on the West Coast was held by Western members of the National Appliance Service Assn. in San Francisco, Oct. 12-13, at the offices of California Electric Service in San Francisco. Some 20 representatives of the major appliance service organizations in the West attended the two-day meeting presided over by Keith Chamblin, California Electric Service, Los Angeles, and president of NASA. Besides a report from the Dallas convention of the organization held recently, the group spent the two days in thorough business discussion of such factors of the appliance repair business as manufacturers' relations, shop and labor relations, operating methods, membership, counter methods, dress of personnel, shipping and receiving methods, production methods, incentive plans, rates of pay, printing and forms, stock and inventory control and repair clinics.

Two outside speakers presented points of view on the public relations of the appliance service business. They were Fred Wood, manufacturer's agent, San Francisco, who emphasized the need of selling and promotion even of a service business. He advocated more contact with wholesalers and suppliers, and some joint effort to publicize the business to dealers lacking service facilities and also the public.

William A. Cyr, associate editor, ELECTRICAL WEST, spoke on the public attitude toward the service and repair business, and need for creating of public confidence. He cited the bad publicity the service business has received and the need for explanation to the public of the high charges necessary to cover present costs of operation.

For a picture of those in attendance, see Profiles, page 130.

F. B. Connelly Co. really let both the public and its dealers in Oregon and Washington know about its "67 Years of Progress," a two week promotion celebrating that length of time in the distributing business. Invitations went to 2,500 dealers to attend. Some $3,000 in prizes were awarded dealers. More than 1,000 attended. A special section of the Sunday *Oregonian* advertised the products handled by the company. Dealers tied in with it. The event centered at the Portland house, although the company has a similar one in Seattle. Frank C. Porter, vice-president and general manager, played host at the open house birthday party.

ELECTRICAL WEST Sales Guide

News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

November 1951

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Governmentally, in both regulations and taxes, last month hit a new high, even if sales didn't, in the appliance business. After log-rolling the excise tax question around all year Congress ups and puts through an extender on all the former taxes and added a long list of appliances that were free before. The 10% manufacturers' tax will up retail prices about 6%. Commercial and industrial air conditioning units seem to be the only excise-tax-free items. Meanwhile nothing yet has been allowed to up prices as per the Capehart Amendment. OPS just doesn't want to do what Congress passed on that one.

Taxes on everything

It isn't helping much, some of the wild appliance and TV advertising on trade-ins and discounts. Never have the papers been so loaded with gimmicks offering giveaways and price deals. Small wonder if the public thinks profit margins must be huge. OPS is not likely to grant price increases if there's so much to give away already.

Giveaways galore

Sunbeam has sued Macy's for $6 million, charging conspiracy to monopolize the sale of its products and destroy its good name as well as the business of other dealers by using its vast economic power to sell Sunbeam appliances below cost. The suit goes after one of the nation's big league avowed price-cutters. This one may go all the way up to the Supreme Court to find out whether a manufacturer can protect his hard earned trademark and quality reputation from big money price cutters. One source reported Macy's stockpiling Mixmasters for another price war.

Real test

In Las Vegas, the dealers are up in arms over Skaggs-Pay-Less price cutting of fair traded appliances, refusing to buy or display any more merchandise that Pay-Less is selling below their costs.

Revolt in desert

The McGuire bill, H.R. 5767, proposed to Congress to tie the knot back under fair trade law that was untied in the Schwegmann case by the U.S. Supreme Court, would amend the Federal Trade Commission Act rather than the Miller-Tydings Act. It is being backed by the Bureau of Education on Fair Trade. Another group, the American Fair Trade Council, has a "22 lawyers" bill ready to submit to amend the Miller-Tydings Act. If all those interested in fair trade can get together and not fight over their respective bills, something may be passed. National Appliance & Radio Dealers Assn.'s check of 100 dealers showed only five opposed to fair trade; a previous 1000 dealer survey showed 81% favorable.

Two bills

Old Range Roundup by the gas industry isn't setting anything afire, reports say, with very few response calls at dealers for contest cards.

Old ranges ornery

NuTone combines a heater and a lighting unit in Heat-A-Lite, a ceiling fixture in which a fan-type heater is mounted. Fan alone can be used as an air circulator. It is mounted out of reach of children, saves wall space, moves warm air down from top of the room. | Dual purpose

Crosley dealers throughout the West were given a refresher on the full line and introduced to its new "twin," a 12 cu ft twin-door (Shelvador in each) refrigerator that takes no more floor space than a 6, with a freezer chest across the top to hold 77 lb of frozen food. Meetings were held by Crosley distributors with factory men helping. Blees was out earlier to meet with the distributors alone this time. Germaine announced a TV warranty for $10 for a year, with full dealer profit. | Have twin too

Perfection Stove Co. is adding a 9 and a 10 cu ft refrigerator to its electric products line. The 10 has a 70-lb freezer chest, the 9 a 52-lb capacity. There's a dry storage drawer across the bottom. | Reefer also

An under-the-counter dishwasher was promised soon by James Manufacturing Co., makers of the mobile automatic dishwasher, but Macy's in SF, Bullock's in LA and Meier & Frank, Portland, have bought up the year's production. The under-counter model sells for about $260, the portable for $199.95. | Two for dishes

Rival Mfg. Co. has equipped its Steam-O-Matic steam-or-dry iron with a carrying case to use it as a traveling iron or for storage. The new lightweight model, with a stainless steel water chamber, weighs only 3 lb. The case in attractive alligator plastic has a fiberglas insert on which to place the hot iron. Iron alone is $19.95, with case $22.95. | Case of convenience

A gadget that should sell well for a Christmas gift is the Eagle Magic Booklite, a little light that clips on the cover of the book and holds the light to the page area, so that one can read in bed without disturbing a sleeper. If the reader dozes the tilt of the light makes it go off automatically. Made by Eagle Electric Mfg. Co. | Read in bed?

First came word of big distributors meetings of Landers, Frary & Clark at Los Angeles, San Francisco and Portland, at which Robert Oliver, merchandise manager, and Shirley Claxon, home economist, spoke. Next came news of Oliver resigning. Now comes word that Landers, Frary & Clark have sold their major appliance operation to Artcraft Mfg. Co. of Lima, Ohio, a private brand manufacturer. Paul Stupin was introduced in LA as new So. Cal. field representative. | Universal news

Hotpoint winners of a vacation included these Westerners: Cy Lewis, Richmond, Utah; Dewey-Belli, Firebaugh, Calif.; Shiveley's, Gig Harbor, Wash.; Stewart's, Seattle; distributor salesmen A. S. Searle, Graybar, Salt Lake City, and R. A. Leonard, Graybar, Seattle; distributor sales promotion managers winning prizes were L. W. Clifford, Hawaiian Electric; L. V. Chase, Graybar, Seattle. | Vacationers

Winners of Easy Washing Machine Co.'s 3rd annual window display contest included Bon Marche of Seattle, and Herdman Electric Co. of Greeley, Colo., who took top honors. Jack West of Seattle won a prize in the Easy district managers contest; F. E. Chenburg of Walter Slagle Co., Denver, of distributors wholesale salesmen's; other dealer winners were the C. C. Anderson Co. in Twin Falls, Ogden, Idaho Falls; Jackson's of Oakland; Masts, Seattle, Wiseman's, Richmond; Beers-Bigelow, Salt Lake. | Window winners

Bendix Home Appliance division of Avco may soon bring out a refrigerator according to Tide. | Too

APPLIANCE PREVIEW

Low-Budget Range

(1) Frigidaire Division of General Motors, Dayton 1, Ohio

Model RO-20 is claimed to have many of the features of the more expensive 40-in. models but to be designed for smaller family budgets. It has the Raymond Loewy styling, including slanted front and one-piece top with top lamp; is porcelain finished inside and out; has a twin unit even-heat oven (16 in. wide, 19 in. deep, 20 in. high), two 6-in. and one 8-in. radiantube cooking units, a Thermizer cooker, Cook-Master and Simpli-Matic oven controls, storage drawers.

Refrigerator-Range Combination

(2) Acme-National Refrigeration Co., 29-24 40th Ave., Long Island City, N. Y.

A combination electric range and refrigerator has two electric burners and 5.8 cu ft of refrigeration capacity. It is 36 in. high, 27 in. wide and 26½ in. deep.

Infrared Appliance

(3) The Crown Boiler Co., 2330 Fifth Ave., New York 37, N. Y.

An appliance that barbecues, roasts and broils with infrared heat, the Rotisserie and Broiler combination has a spit and skewer that is revolved automatically at a fixed speed by an a-c motor. A detachable aluminum spatter shield fits over the front while the rotisserie is in operation. By removing the spit and skewer, the appliance becomes an infrared broiler with four broiling levels. The alloy infrared element is rectangular to cover the entire broiling surface.

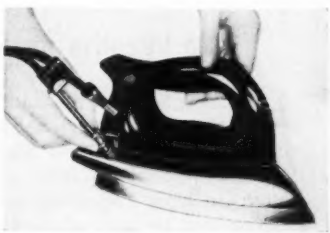
Home Freezers

(4) Gibson Refrigerator Co., Greenville, Mich.

A new streamlined freezer gives 13 cu ft of storage in space formally required for the 10-cu-ft model. Featured by the manufacturer is a separate quick-freeze compartment that provides freezing down to 10 below zero and permits the owner to quickly freeze up to 102 lb of food. The rest of the cabinet provides 10.13 cu ft of frozen food storage for up to 354 lb of food. The model is cataloged as HF-1391.

(5) **FRYER** — Chicago Electrical Mfg. Co., 6333 W. 65th St., Chicago, is offering a Handyhot deep fat fryer with a Temp-O-Lite signal light, control and dial to permit selection and maintenance of desired temperature. The device can be used also as a dutch oven, the manufacturer states.

(6) **REFRIGERATOR** — A full-length door is a feature of the new 6-cu-ft Quicfrez made by Sanitary Refrigerator Co., Fond du Lac, Wis.



Combination Iron

(7) Sunbeam Corp., 5600 Roosevelt Rd., Chicago 50, Ill.

A lightweight combination steam or dry iron permits the user to plug in for steam as she does for current. Water for steam is contained in a jar and is fed directly to the soleplate of the iron. Pressure is provided by a pump on the water jar. Increased sensitivity of the thermostat decreases the temperature difference between dry and steam ironing so that the user can go from one to the other and back again instantly. Steam is said to come out with a force that puts it deep down into the fabric and beyond the bottom of the soleplate. The Ironmaster weighs 2¾ lb.

(8) **POLISHER** — A twin-brush electric polisher made by Shetland Co., Lynn, Mass., is announced as a heavy-duty machine for all types of floors. It comes with Tampico brushes for polishing and Palmetto brushes for waxing and scrubbing.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

Not good after January 1

Please send me, without obligation, more information on the appliances described on this page and identified by numbers circled below:

1 2 3 4 5 6 7 8

NAME ..... **TITLE** .....

COMPANY* .....

ADDRESS .....

CITY ..... **STATE** .....

*** Please include your company's name and your position, since we cannot ask manufacturers to furnish literature unless you do.**

ELECTRICAL WEST

No Incentive for Dealers

PERHAPS some appliance manufacturers do not realize what they are doing, but present trends will lead to a gradual attrition of dealers. Nothing in the industry seems to be so changeable and unstable as the selling policies of appliance manufacturers. They shift from one form of distribution to another, they reduce the number of dealers, then overnight expand the number without regard for those they have had. They go from direct to through-distributors and back again. They increase margins and they decrease them. Management personnel seem to play "musical chairs" skipping from one manufacturer to another—and with each change, a change of policy tune.

Latest trend seems to be to cut away the margin from a dealer by almost imperceptible amounts. The result is that whereas prewar a pretty general level of from 37 to 40% was maintained on markup, now the dealer totals his books and finds less than 25%. There is great hullabaloo about hiring, training and keeping salesmen in the field, but on such margins there is nothing to pay them with.

If a salesman could sell $600 in merchandise a week when the dealer could pay him from 12 to 15% commission, he could make about $100 a week—and they were 100-cent dollars prewar. But a salesman today selling $1,000 a week, on a 5% commission gets about $50, and they are 35-cent dollars. No wonder good salesmen desert appliances.

One way in which margins have been cut without saying so has been to eliminate delivery to the dealer store. This means from 2 to 4% off the margin. A new one is to charge back to the dealer about 8% for a factory central service station.

It is no wonder many of the large and substantial merchandising stores are de-emphasizing appliances, making no special effort to sell them. They have become an accommodation item, not a profitable one. As other dealers learn what is happening to them they too shift into supplementary lines that are not electrical.

After all it is the profit system under which this economy is run—and there ought to be some profit to keep it running.

Peace in the Valley

WHEN the US Bureau of Reclamation and Pacific Gas and Electric Co. signed a 10-year power contract last month, peace descended on the Central Valley. The power contract, coupled with a previously signed 10-year wheeling contract, finally settles a bitter controversy that featured more in-fighting than the recent Louis-Marciano prizefight.

The settlement does not please everybody concerned. Both the bureau and PG and E made concessions and the contracts represent fair and reasonable compromises. The main point is that both parties benefit substantially and the taxpayer gains most of all. PG and E is assured sizable quantities of capacity and energy at equable prices based upon today's investments and costs. Also the utility is protected against subsidized competition masquerading under the so-called preference clause. The USBR obtains sizable revenues to help amortize the Central Valley investment and to reduce the cost of water to the irrigationists. Also its hydro is firmed up without additional investment. The taxpayer profits because additional appropriations for duplicating steam plants and transmission lines will not be necessary.

Of special significance is the fact that the pressure for an early and equitable solution of the differences between the USBR and the PG and E came from Congress. Without that pressure, especially on the bureau, the controversy might have dragged along for years.

In specifying obligations and responsibilities of both parties the two contracts define a cooperative power policy under which everybody can live. Integrated operation of the two power systems is assured. But best of all, one of the major fields of conflict in the industry is now peaceful because of the statesmanship of the negotiators.

EDITORIAL VIEWS

Court Blocks Interior

WHEN a federal court told the Department of Interior that it had no divine right to all of the water power in a river basin last month, the way was opened for an early settlement of the argument over power development on the Kings River in California. In the Roanoke Rapids case the judge ruled that an FPC license granted the Virginia Electric Power Co. was valid even though the project was in an area where a comprehensive basin-development plan had been devised. Unless Congress itself specifically reserves the site for federal development, the Interior Department has no right to attempt to prevent private utilities from building plants, the court said.

The Roanoke Rapids decision throws a strong road block in the way of Interior's notion that all power development in government-approved programs is its sole responsibility. Here is how the court put it in one place in the decision: "The only responsibility of the Secretary relates to the disposal of surplus power from government projects; and no duty or responsibility with regard thereto can possibly arise until the government has authorized the project and entered upon its construction. Until then he has no more duty or responsibility in this connection than the Postmaster General."

On the Feather River, the Secretary of Interior is fighting to secure the withdrawal of an FPC license granted Pacific Gas and Electric Co. The grounds are much the same, namely, that the Feather River area is part of the comprehensive Central Valley project approved by the President, and hence reserved for Interior. Both the utility and the FPC hold otherwise. A precedent in support of that contention seems to have been set by the Roanoke Rapids decision.

Grounding of Portables

SAFETY to persons in many cases depends on grounding the frame of a device, such as a portable tool, or a washing machine, by means of a three-wire cord and a grounding receptacle and plug cap. Recently manufacturers developed such a receptacle and cap, the grounding prong of which was U-shaped so that it would not fit into the narrow parallel slots for the energized circuit. But before any progress has been made in selling this idea to the public one manufacturer already has changed the design. A standard must be adhered to if it is to merit acceptance.

WHEN a person gains power over other persons—the political power to force other persons to do his bidding when they do not believe it right to do so—it seems inevitable that a moral weakness develops in the person who exercises that power. It may take time for this weakness to become visible. In fact, its full extent is frequently left to the historians to record, but we eventually learn of it. It was Lord Acton, the British historian, who said: "All power tends to corrupt; absolute power corrupts absolutely." Please do not misunderstand me. These persons who are corrupted by the process of ruling over their fellow men are not innately evil. Their motives for wanting to direct the actions of others may be purely patriotic and altruistic. Indeed, they may wish only "to do good for the people." But, apparently, the only way they can think of to do this "good" is to impose more restrictive laws. . . . If the benevolent ruler stays in power long enough, he eventually concludes that power and wisdom are the same thing. And as he possesses power, he must also possess wisdom. He becomes converted to the seductive thesis that the election to public office endows the official with both power and wisdom. At this point he begins to lose his ability to distinguish between what is morally right and what is politically expedient. — Admiral Ben Moreell, president, Jones & Laughlin Steel Corp.

Rome •

The Metropolitan Life Insurance Company Park Merced apartment development in San Francisco includes eleven towers, as well as two-story buildings, (illustrated below). Typical of each main board and meter room is the Rome • EMT installation shown above. Easy to handle and simple to connect, Rome • EMT reduces installation costs. Electrical Contractor: Charles A. Langlais Co.—Electrical Conduits: Rome • EMT.

Rome • EMT straight lengths are available in ½", ¾", 1", 1¼", 1½" and 2" while 90° elbows are carried in ¾", 1", 1¼", 1½" and 2".

Warehouse stocks located as follows:

Chicago, Illinois
Dallas, Texas
Denver, Colorado
Los Angeles, California
Salt Lake City, Utah
San Francisco, California
Seattle, Washington
St. Paul, Minnesota
Torrance, California

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SPECIFIED FOR SAN FRANCISCO'S HUGE PARK MERCED PROJECT

SPEEDS UP INSTALLATION!

REDUCES COST!

For unexcelled wire and cable performance:

RoZone®

RoMarine

RoPrene®

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RoBarn

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Remember these names for dependable quality.

It Costs Less to Buy the Best

In a project such as San Francisco's Park Merced apartment development, the electrical wiring is encased in thousands of feet of steel conduit . . . *for safety and dependability*. Selection of Rome•EMT for this job came naturally because of its uniformly high quality and easy workability. By customer choice, it is the preferred electrical metallic tubing in the West.

Inside and out, Rome•EMT is tops in quality. The electrogalvanized exterior has an even, uniformly thick, solid coating of zinc that assures maximum corrosion and abrasion resistance. Diameters and wall thicknesses are unusually accurate. Inside there is a clean, mirror-smoothness that electricians really appreciate. Approved by Underwriters' Laboratories, Inc., Rome•EMT exceeds all standards for thin wall raceway.

With Rome•EMT you work the easy, economical way. Light in weight it is easy to handle and easy to bend. There is no expensive, time-consuming threading for connections. You simply use trouble-free, compression type fittings that go on in a hurry. You save on fishing and pulling of wires, too. The inside of Rome•EMT is "clean as a shotgun barrel" with an anti-friction high gloss finish. There are no burrs or rough edges to create "drag" or damage costly cables.

Rome•EMT is stocked by conveniently located western warehouses and jobbers. Call your electrical wholesaler or nearest Rome Cable office today.

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Distributors Look Ahead

The only competition for the majestic grandeur of Yosemite National Park was the copper situation, as nearly 300 electrical distributors and their guests met at the Ahwahnee Hotel Oct. 1, 2 and 3, for the annual Fall Convention of the Pacific Zone of the National Association of Electrical Distributors. Millions have admired the sheer granite walls of Half Dome reaching into the sky, but probably none before were heard to remark "now if that were all copper ore."

With the theme "Shortage or Surplus, Sell the Need," the distributors and electrical industry representatives from the 11 Western states met to attend a program based on realistic study and understanding of the conditions under which the industry is and will have to work during a period of half-peace, half-war economy. Utilizing members of their own zone, specialists from outside the area, and government officials, the distributors met for three consecutive sessions to hear reports on the electrical industry advisory committee, an analysis of the new copper order, the responsibilities of the appliance distributor, problems in retail financing as it relates to wholesalers, the values in market research, and a picture of the present and future of the electric power supply on the West Coast.

How the electrical supplies distributor must operate to maintain his stocks of copper products under the new copper order was explained by M. O. Porter, assistant chief, wire mill branch, copper division, NPA. Explaining that as of the day he spoke, the DO system was no longer in effect, Porter said that, "commencing on Oct. 1, a distributor may apply an X6 order to replenish his stocks. Your X6 order will be just as good as any CMP order." He said that delivery dates from the mills for copper wire products under X6 have been set as 35 days following the first of the succeeding month after receipt of the order. He told the distributors that protection clauses have been set into the new order to "prevent raiding" of Western stocks by other distributors or other industries.

Appliance responsibility—In a paper read to the appliance distributors at a closed luncheon meeting, Ben Gross, vice-president of NAED and chairman of its appliance division, said that ". . . the responsibility of the distributor in the appliance industry is a major issue of vital importance to all three levels of the industry." He outlined in detail these responsibilities:

1. **To operate as the sales arm** of the factory in the territory for which he is franchised.

2. **To maintain a satisfactory inventory** so that he can service his dealers promptly.

3. **To be adequately financed** to pay bills promptly, to extend credit intelligently, and to build his distributive organization.

4. **To maintain a capable sales promotion** and advertising staff to carry out the manufacturer's campaigns and to administer cooperative funds in a productive manner.

5. **To have a sales department** capable of training dealer personnel.

6. **To maintain a good service and parts department** and be able to train dealers and their service organizations.

7. **To have adequate quarters** for the display of his products both as a working display and as an example to his dealers.

8. **To maintain adequate records** and cost data on both his own and his dealers' operations.

At this luncheon meeting, for which Nelson Thomas, president of Thomas Distributing Co., Los Angeles, was host, the group recommended that the NAED's national board of governors protest to OPS the hardships induced on Western distributors because of "discriminatory freight rates."

Trade-ins—Distributors were asked to watch their dealers to see that the trade-in ruling is not abused. In his address at the opening session, Charles Pyle, executive director of the NAED, said that "the shortsightedness of a few aggressive dealers might well undermine the good work that resulted in the easing of the credit terms." Pyle reported to the Pacific Zone members on the activities of the national headquarters of NAED, particularly its work in Washington representing the distributors in relation to all legislation.

Financing dealers—Ninety per cent of appliance dealers would not be able to stock a representative line of merchandise without some plan of financing their stock, said W. J. Livermore, Westinghouse Electric Corp., in his talk on retail financing and its relation to the distributors. He pointed out that a recent survey showed that 34% of business failures were caused by poor financing. He contended that there is a need for a concerted public relations campaign by distributors and manufacturers to make banks and other lending agencies realize the current financing needs of dealers.

Still independents—There is no trend toward replacing the independent distributor with factory branches, according to Frank W. Mansfield, di-

Stadium Lighting Installation—Pole base mechanism permits 3-ganged cutouts to be switched from ground.

Combine fuse protection with "disconnect-under-load"

Low-cost G-E oil fuse cutouts give you both

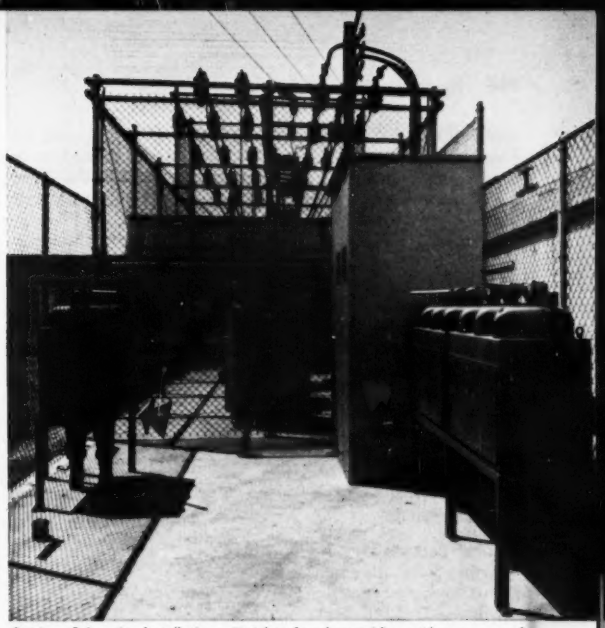
In the G-E oil fuse cutout all arcing occurs under oil when the fuse blows or when switched. The housing, with its drawn steel tank threaded into cast-iron cover, is liberally designed for safety; withstanding internal pressures well in excess of those that can occur at the cutout's interrupting rating. There are no exposed live parts—whether the cutout is in open or closed position—and no expulsion of arc flame.

Special arcing surfaces on the heavy self-aligning contacts keep load-carrying surfaces clean—make it possible to use these cutouts repeatedly as switches to open circuits under loads.

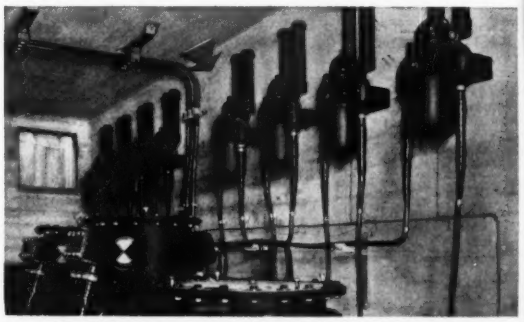
Suitable for both utility and industrial applications, these cutouts are—

1. **Available for 2400-, 4160-, and 7200-volt circuits, current ratings up to 300 amperes; interrupting ratings up to 11,000 amperes.**
2. **Ideal for indoor mounting, vault or subway mounting and outdoor pole or wall mounting.**
3. **Available in metal enclosed assemblies, single or three-phase, rack or wall mounted, and providing for cable, conduit, or pothead connections.**
4. **Provided with switching mechanisms for single- or three-phase switching and pole base operation on rack-mounted or metal-enclosed units.**

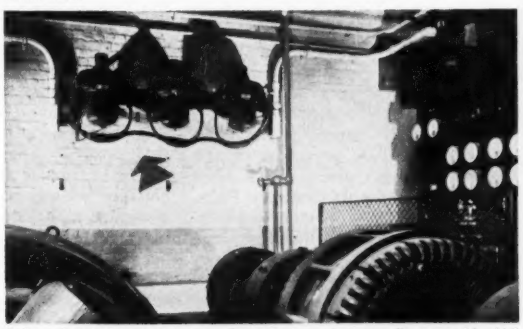
Full information can be found in Bulletin GEA-732—available through your G-E Apparatus Office, or by writing, *General Electric Company, Schenectady 5, New York.*



Outdoor Substation Installation—Metal enclosed assembly avoids exposure of cable entrances and gang-operated mechanism provides for simultaneous switching.



Subway Installation—Expansion chambers attached to cutouts permit complete submersion.



Indoor Substation Installation—Oil cutouts in incoming lines provide high current fusing.

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

rector of market research for Sylvania Electrical Products Inc., in his address to the convention. "I fail to find any evidence where the death knell is being sounded for the independent wholesaler," he said. Prospects for business in the electrical industry are good for 1952, Mansfield stated, but shortages might limit it somewhat. However, he claimed that "such shortages will not be serious. There is nothing in our economy that can't make for both a healthy civilian economy and a defense program."

The present and future outlook for the electric power supply in the West was reviewed for the distributors by O. R. Doerr, vice-president of PG and E.

Plus the sightseeing that was a natural part of a convention held in Yosemite, the distributors and their guests took part in other activities including a cocktail party on the first day, the traditional chairman's dinner, and the closing golf banquet.

E. A. Phillips, chairman of the Pacific Zone of NAED, presided at the sessions. Harry C. Gerster was chairman of the convention committee, assisted by Roy Kimberlin and Leslie Stusser. Charles Mathews chairmanned the program committee with Lois Kaplan, D. A. Smith and A. H. Meyer. Zone Secretary R. A. Balzari handled arrangements for the meeting.

The wholesalers announced that the next meeting would be held at the Empress Hotel, Victoria, B. C., on May 12, 13 and 14, 1952.

Contractors

Idaho State Electrical Contractors Assn. plans an annual meeting, Dec. 3-4, at Boise, at which Idaho electrical dealers will also be invited, looking toward forming a joint association for the promotion of all things electrical in the region. J. J. Gilgan Jr. of Caldwell is president of the Contractors Association and J. Carl Baldridge of Boise its secretary. Plans were outlined at a meeting early in October. Two separate luncheons, one for the contractors, one for dealers, will be held on the Monday noon meeting, after a joint organization morning session. Wholesalers, manufacturers and the power company will have a half-day program on Tuesday morning. Other details of the program will be announced later.

Pacific Electrical Contractors Assn. in Portland is holding two regular meetings and two program meetings at the Builders' Exchange in Portland each month. At a recent meeting, the forms used by electrical contractors were discussed by Arthur McLean. Dates ahead in November for meetings are the 13th and 27th. Recent meetings were held with the Portland Home Builders Assn. and with the city and state electrical inspectors to discuss the problem of electric service connection on the new ranch-type one-story houses.

NECA

Returning delegations from the 50th Anniversary Convention of the National Electrical Contractors Assn. at Washington, D. C., Oct. 8-12, describe it as a most colorful convention and a peaceful one. The only contest of opinions was over a change in the dues and a method of getting dues from large traveling contractors when they work in the jurisdiction of chapters other than their own. Ed Buttner, Scott-Buttner Electric Co., Oakland, was re-elected labor relations committeeman for Division 6, comprising the Western states. E. B. Defeyter of Spokane, who had been proposed as a candidate, withdrew. Don B. Clayton of Birmingham, Ala., was elected president of the NECA to succeed Erne Carlson of Youngstown, who had filled the office since the death of Edward J. Vanderlinde of Rochester.

Changes in the dues constituted the only issue of importance before the convention business session. These were submitted as constitutional changes to be voted upon by the entire membership, according to the procedure. A dues committee had been set up at the Los Angeles convention last year to study the entire structure of dues and revenue of the association and many of the proposals came from this committee. It was decided at the beginning that nothing would become effective until Jan. 1, 1952.

Among the changes proposed were that honorary membership possibilities be broadened and a veteran membership was authorized for former contractors no longer engaged in the business who had served for a number of years in the association. Dues for the first year for a new member were set at $50 and for the second and each subsequent year the dues are one-fourth of one per cent, instead of three-tenths of one per cent, of the amount of productive labor pay roll for all electrical contracting business, exclusive of motor repairs and rewinding, but not less than the minimum provided. The minimum annual dues were voted to be $50 and for any individual member $150 because the individual member demands and frequently receives as much service from the association as members of chapters. Dues for members on business transacted outside the continental United States, except Alaska, were set at $50.

The controversial problem of dues for traveling contractors was settled by requiring that each chapter be responsible for collection and transmittal of the dues for the national and chapter for work of members in the jurisdiction of another chapter having temporary membership privileges, but that the responsibility would in no case exceed that amount which when added to the national dues equals 1% of the productive electrical labor pay roll involved.

A proposal from the Los Angeles Chapter that the national headquarters set up a fund to build its own building was turned over to a committee to undertake a study of the plan. Another policy resolution was to set a membership quota of 1,000 new members for 1952.

The convention was well represented from the chapters in the 11 Western states. Robert L. Wilkinson, manager of the Inland Empire Chapter at Spokane, was the only Western speaker on the program. He spoke on the subject of ethics, describing the code of ethics set up by his chapter and stating that any program of ethics had to stand up under three yardsticks, namely, (1) publicity to the public, (2) limitations of the law, and (3) religious and moral principals.

San Francisco Electrical Contractors Assn. heard a request from IBEW Local No. 6 for a raise from $2.75 to $3 per hour beginning January 1, at its Oct. 25 meeting. Charles Langlais, governor of the chapter, reported on the convention and urged that a fund be built up to assist members of the chapter to attend future conventions. He told of attending a meeting of the construction advisory committee of NPA, at which a policy was announced of distributing available stocks of critical wire and conduit through wholesalers under the CMP system. Others who reported on the convention were President William Kennedy, Treasurer M. L. Webber, Director Bert Doherty and Chapter Manager William J. Varley, who has been re-elected chairman of the Chapter Managers Institute.

Northern California Chapter, NECA, probably will have 30 or more enrolled in the first accounting course to be set up under the NECA research and education program. Start of the

For transformers...
inhibited oil
or non-inhibited oil

Manufacturers say **INHIBITED**

At the October 1950 meeting of the Edison Electric Institute in New York, leading manufacturers of electrical equipment announced their intention to switch to oxidation-inhibited oil for transformers, switchgear and other equipment manufactured by them.

Experience of users says **INHIBITED**

Southern California Edison Co., Los Angeles Department of Water and Power, San Diego Gas & Electric Co., Central Arizona Light and Power Co.—these and many other big users have switched to inhibited oil. They have done so because tests in their own equipment proved: that inhibited oil will last many times longer than conventional oil, due to the improvement in oxidation resistance; that inhibited oil helps to prolong the life of the equipment itself because it guards against deterioration of insulating fabrics and other materials; *that transformer maintenance costs are much lower due to the all-around superiority of inhibited oil.*

and here is the **most widely proved inhibited oil** for transformers

- Introduced in 1946—first of its type
- After 5 years of use under some of the most severe operating conditions, it's still "like new" (in the same installations, conventional oils deteriorated badly in two years)
- On its record to date, service life estimated at up to 50 years
- All-around superiority proved by experience of leading power companies
- Suitable for voltage regulators, circuit breakers, and oil-filled bushings and switches

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SAVE HOURS ON
CONDUIT AND PIPE
INSTALLATIONS

...with a GREENLEE PIPE BENDER

Cut costs, speed your jobs this efficient, easy, economical way. Make "on the job" bends in pipe and rigid conduit up to 5", thin-wall conduit and tubing with a GREENLEE Hydraulic Bender. One man operated for fast, accurate, uniform bending. Simple to operate, easy to set up and shift from job to job. Not only saves labor, but eliminates cost of many manufactured bends and fittings. Often pays for itself on first few jobs. Write today for free folder No. E-201.

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Other GREENLEE timesaving tools for industry: Hand Benders for Tubing • Hydraulic Pipe Pushers Knockout Tools • Auger Bits and Drills • Spiral Screw Drivers • Chisels and Gouges • And many others. Greenlee Tool Co., 1771 Columbia Ave., Rockford, Ill.

course has been delayed to Nov. 19. It will be conducted at the Merritt Business School in Oakland on Monday evenings for some 20 to 30 sessions of the course. At a meeting Sept. 27, the course was explained by Manager Ernest Kramm; Miss Marion Malloy, principal of the Merritt school; George W. Ney, instructor; Ed Buttner, a member of the NECA committee; and Matt Sherwood, Western regional director. The course is one developed under the direction fo E. R. Cornish, former Western director and now director of the research and education department of NECA.

IES

Dates for the regional conference of the Illuminating Engineering Society for the Pacific Southwest Region have been set at March 13 and 14, 1952, in San Francisco at the Sir Francis Drake Hotel, according to H. H. Robison, general chairman. Sam Hazelton, G-E Lamp Department, is chairman and John Walsh, PG and E, attendance chairman. The Northwest regional conference will be held in March also, in Victoria, B. C.

An Arizona Chapter of IES may soon blossom from the efforts of Jerry Whitnell of Central Arizona Light & Power Co., who has had a series of preliminary meetings in Phoenix. The charter meeting may be held sometime in November.

Utah Chapter, IES, heard Miss Kay Leighton, home illumination engineer of General Electric Co.'s Nela Park, speak on "Light Conditioning Today's Home" at the Oct. 10 meeting.

Northern California Section, IES, visited the new illumination, radiation and standards laboratories in the Cory electrical engineering hall at the University of California, Oct. 11. At the previous meeting Beth McCrone, with the consulting engineering firm of Charles Von Bergen, spoke on "Light For Living." She is now the secretary of the section.

NWEL&PA

R. E. Gale, Idaho Power Co., resigned as first vice-president of Northwest Electric Light & Power Assn., and John Dierdorff, vice-president of Pacific Power & Light Co., was elected to fill the position for the coming year. A. W. Trimble, president of Mountain States Power Co., was elected second vice-president of the association.

A. S. Cummins, California Oregon Power Co. president, announced the appointment of K. E. Hutchinson of his company as treasurer, and the following section chairmen: Accounting and Business Practice, F. C. Bash, California Oregon Power Co.; Business Development, A. H. Greisser, Portland General Electric Co.; Engineering and Operation, C. H. Kirk, Montana Power Co.; Personnel, L. B. Jack, B. C. Electric Co.

The following were named members-at-large of the board of directors to represent the utility members: A. S. Bennion, Utah Power & Light Co.; Earl Olson, Idaho Power Co.; Allan A. Smith, attorney for Mountain States Power Co. and Pacific Power & Light Co.; W. L. Thrailkill, Washintgon Water Power Co.; Howard N. Walters, B. C. Electric Co.

At the recent meeting of the board section chairmen told their plans for the coming year. Each will hold a planning meeting of his executive group this fall to set the time and place and arrange the program for the spring meeting.

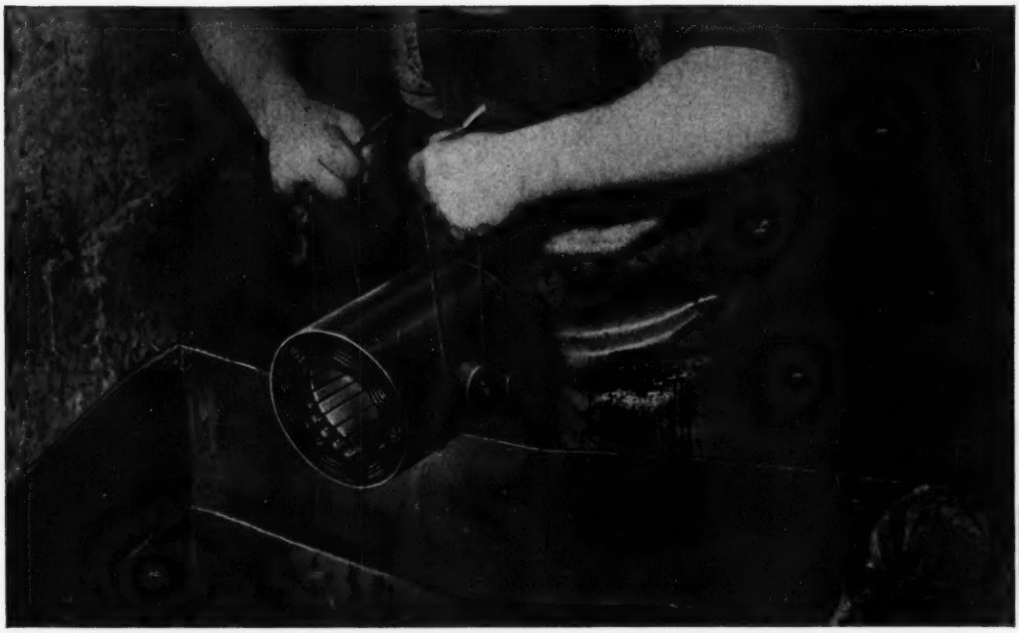
CMUA

The California Municipal Utilities Assn. has its 19th annual conference at Oakland, Nov. 13-16, with President J. H. McCambridge, Burbank, Public Service Department general manager, presiding. A report on the meeting will be made in the December issue.

NISA

William M. Hogue, Larsen-Hogue Electric Co., Los Angeles, has been named on three committees of the National Industrial Service Assn., the industrial relations, publicity, and trade relations committees. Other Westerners on committees are William E. Boyd, Pacific Electric Motor Co., Oakland, on industrial relations; J. H. Horton, Daley Electric Co., Phoenix, and George Larsen, Larsen-Hogue Electric Co., Los Angeles, on building standards.

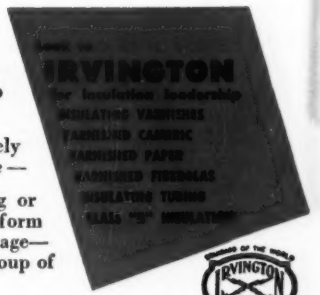
● **A. B. Smedley,** manufacturers' agent at Altadena, Calif., was installed as president of the Manufacturers' Agents National Assn. during a Founder's Day meeting held in Los Angeles, Oct. 17, in honor of the group's founder and outgoing president, E. A. Wilcox of San Francisco. Other Westerners elected to the organization are Carl A. Stone, Los Angeles, Western vice-president; Albert M. Solen, Denver, and E. P. Gildsorf, San Francisco, as directors. Headquarters are at Alhambra, Calif.



"For high temperature service at low varnish cost, OUR CHOICE IS HARVEL 612-C"

Mr. R. Mowery, Chief Engineer of DeWalt Inc., manufacturers of world-famous woodworking machines, tells *why* his company has been using Harvel 612-C Insulating Varnish *consistently* since 1936:

"We have to have a varnish that stands the high temperatures under which our motors must operate. The varnish must retain adequate flexibility to prevent cracking under severe service conditions. Thinning solvents used for the varnish must not affect the motor insulation. Harvel 612-C is absolutely the best varnish we can buy at the price to meet these requirements. Any other varnish that will do the job would cost us twice as much."



Harvel 612-C is *one* of the Irvington internal curing varnishes widely used by makers of motors and other electrical equipment *because* —

They *cure throughout* by polymerization—no risk of softening or throwing out at high speeds and temperatures. They *cure fast* to form firm, tough coatings of high strength. They are stable in storage—stable in service. Get the *full* story on the advantages of this group of Harvel Varnishes—just mail the coupon below.

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THE MONTH IN BRIEF

American Has Until Jan. 1 to Arrange Sale

Although SEC last month gave American Power & Light Co. until Jan. 1 to arrange a sale of its Washington Water Power stock to state PUDs, it stipulated that American file a plan by Nov. 4 for distribution of the stock if it has not filed notification of sale by the Jan. 1 deadline. At the same time, the commission authorized a $2 per share cash capital distribution to holders of American capital stock as part of the dissolution plan. It also permitted Electric Bond & Share to keep its American stock until action is taken on disposal of WWP stock, but ordered Bond & Share to file by Nov. 4 a disposition plan for the Washington stock in the event it is distributed by American. It was unnecessary at the time to consider what Bond & Share should do with any cash it receives if WWP is sold, the commission said. PUD officials were quoted as saying that they had no knowledge of a pending deal for the properties.

PG and E Brings in "5 Million KW" Plant

Heat energy equivalent to that produced by a 5,340,000-kw steam-electric station is being brought into the San Francisco Bay region daily by the Pacific Gas and Electric Co.'s new 34-in. natural gas line from Texas. This is only a little less than half the demand on all the power systems in the 11 Western states. Gas pipe lines carry prodigious amounts of energy. The line is 1,349 miles long and has a capacity of 400 million cu ft in 24 hours. Btu equivalent of this gas is 128 million kwh per day, or approximately twice the daily generation of all of the company's hydro and steam plants combined. If the gas were burned under boilers in a steam plant at a thermal efficiency of 32%, it would operate a 1,535,000-kw plant. Burned domestically and industrially at an efficiency of 50%, it is the equivalent of 64 million kwh, or the 24-hour output of a 2,670,000-kw plant. If the 5,340,000 kw of electrical power could be transmitted the distance from Texas, which of course it cannot, at 230 kv with 200,000 kw per circuit, 27 lines would be required.

Skagit PUD Suit Postponed

Condemnation suit of the Skagit County PUD against Puget Sound Power & Light Co. properties in the county has been postponed until April in federal court at Bellingham, Wash. The company asked for the continuance, pending the outcome of negotiations and studies being conducted by seven PUDs for joint purchase of the company's remaining properties.

Kitsap PUD Signs with Myers

Kitsap County PUD of Bremerton, Wash., has approved a new one-year agreement under which Guy C. Myers of New York will act as the district's agent in proposed acquisition, with six other PUDs, of Puget Sound Power & Light Co. Compensation remains the same as under earlier agreements, 1% of the bonds issued to purchase the properties. The PUD commissioners split two to one on the new agreement. J. W. Bryan, who dissented, objected to joining with other districts in the purchase plan. Representatives of the public asked the commission to postpone agreement with Myers until terms had been publicized and discussed.

Doubles Before Starting

Less than 30 days after Pacific Gas and Electric Co. announced a new 600,000-kw steam plant the company decided to make it 1,200,000 kw. System peak is near three million kilowatts and it takes a 300,000-kw plant (like Moss Landing or Contra Costa) every 10 months to keep pace with normal load growth.

Transmission at 300-315 Kv

Bonneville Power Administration will use a transmission voltage of 300-315 kv to get more power over lines. Autotransformers at terminals will permit integration of the 300-kv lines with the present 230-kv system. Alcoa is building a 1.6-in. expanded ACSR conductor for the new lines.

Noncorrosive Covering

One utility has found that any greaselike coating gives most effective and longest protection to electrical conductors and hardware in beach or air contaminated industrial areas.

Frank Bird Plant Dedicated

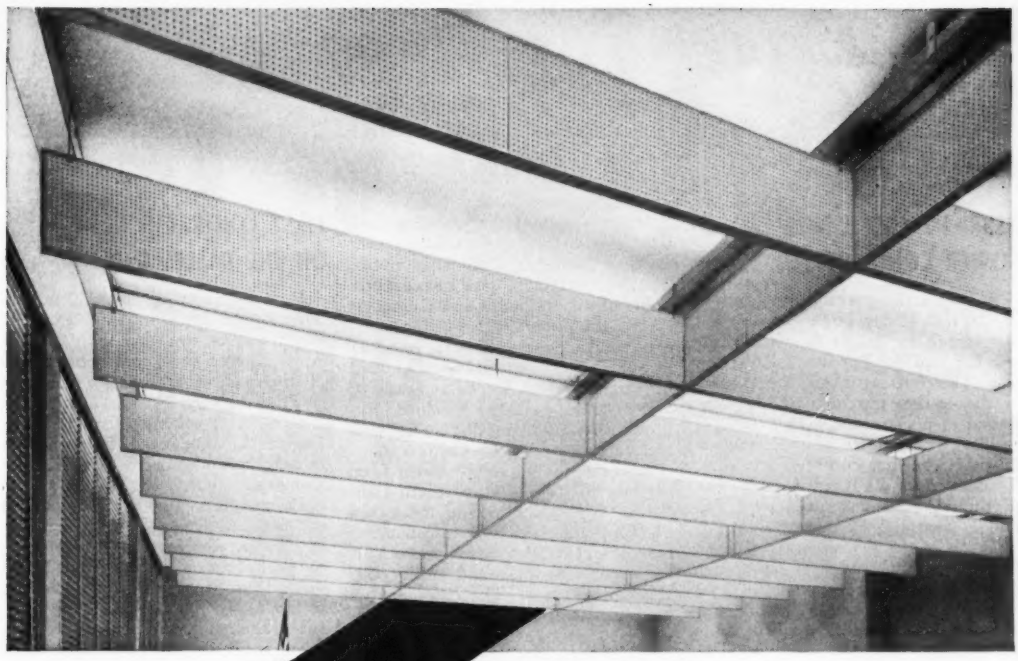
Montana Power Co.'s Frank Bird steam-electric plant at Billings was dedicated on Oct. 6. Ceremonies included a luncheon, an afternoon program at the plant and a dinner given by the board of directors in honor of Frank Bird.

Franchise Given Big Yes Vote

By a vote of 664 to 20, Prescott, Ariz., voters granted a 25-year franchise to Northern Arizona Light & Power Co., subsidiary of Central Arizona Light & Power. Sixty per cent of the qualified electors went to the poles on election day, Oct. 5. A new feature in the franchise is a 2% tax on gross revenue of both residential and commercial business.

Better Finishes

Electrically superheated dry steam is now mixed with the paint in a spray gun to give better finishes. Finishing materials of higher viscosity can be applied in thicker films with one pass of the gun, resulting in coatings free from blemishes, sags, popping or runs with fewer coats.



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The new Curtis Light and Sound Conditioning System offers an entirely new approach to LIGHTING and SOUND CONDITIONING problems. The system provides quality low-brightness illumination with acoustical treatment which eliminates excessive sound reflections and the annoyances and distractions which sound creates.

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The Sound System—The vertical baffles are constructed of highest quality acoustical material with a flame retarding, high reflectance washable finish. The baffles are positioned between the 8 foot, T-12, single pin fluorescent lamps to provide both recommended shielding and sound conditioning.

Yes, the Curtis Light and Sound Conditioning System offers the finest in lighting and sound conditioning efficiency from the stand point of low initial cost, low installation cost, low operating cost and low maintenance cost.

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THIS MONTH'S NEWS

USBR, PG AND E SIGN POWER CONTRACT

A 10-year agreement covering sale of Central Valley power was signed last month by Pacific Gas and Electric Co. and the Bureau of Reclamation. The contract follows three years of day-to-day purchase and a long period of negotiation.

The power contract supplements a 10-year wheeling contract providing for delivery of CVP power to certain of the bureau's customers over PG and E lines.

Terms of the power contract cover purchase by PG and E of power not required for preference customers or federal agencies. This power is sold under three classifications—firm, nondependable firm and surplus. The contract establishes 300,000 kw as dependable capacity for the present CVP system (Shasta and Keswick Dams, nameplate 450,000 kw), in effect firming it up to this amount with steam capacity of PG and E. Under the contract, PG and E reserves the right to buy the dependable capacity remaining from the 300,000 kw after bureau customer requirements are satisfied, plus nondependable and surplus power.

The contract specifies in detail the amount of energy that must be delivered for each kw of capacity sold as firm, the amount varying month by month to reflect the company's annual load requirements. Purpose of this provision is to assure maximum integration with PG and E's large and varied generation.

Charge for this dependable capacity is 75c per kw, energy charge is 4 mills per kwh for the first 130 kwh per kw, 3 mills for the next 130, and 2 mills for all above 260 kwh per kw. Nondependable firm capacity, which must be specified by the bureau for a five-month period 60 days before the period begins, is 25c per kw, with 3 mills for the first 260 kwh per kw and 2 mills above. Surplus energy will be sold for a straight 2 mills. The bureau will be able to buy energy back from the company with a 15% handling surcharge up to but never exceeding the amount delivered to the company.

Under terms of the wheeling contract the bureau is now selling power to nine northern California public agencies, mostly military installations, with delivery over PG and E lines. It specifically prohibits supplying preference customers or federal agencies located within an incorporated area in which PG and E sells at retail, or any customer outside a specified service area roughly bounded by the central valley of northern California.

Agencies eligible to buy direct from the bureau include 11 northern California cities that operate their own distribution systems, miscellaneous federal and state agencies, and a scattering of irrigation and utility distribution districts. The cities are all buying power from PG and E under contracts that do not expire until 1954 or later, and which the agreement specifically provides cannot be violated. Some have shown interest in buying from the bureau when their contract expires, but some city councilmen are expected to balk at the requirement that any savings must be passed on to the customer in reduced rates. This is contrary to policy in some of the cities, which have been using electric distribution profits to reduce property taxes.

Under the law the company must file an application with the California PUC for an order authorizing it to carry out the contract terms.

PGE Studying New Hydro Development in Oregon

Portland General Electric Co. has asked FPC for a preliminary permit for a hydro development in Jefferson County, Ore. The project would be on the Deschutes, Metolius and Crooked rivers, upstream from the proposed Pelton Dam on the Deschutes.

To be designated the Round Butte project, the development would include a concrete gravity dam on the Deschutes creating a reservoir extending up that river for about 8½ miles and up the Crooked and Metolius rivers about 8½ and 10 miles respectively. A power house, downstream from the dam, would contain three units, totaling 225,000 kw.

FIRST CONTRACTS NEAR ON THE DALLES DAM

First contracts on the $350 million The Dalles Dam in the Columbia River will be awarded in March or April of next year, and construction of the project will get under way shortly thereafter, Col. Thomas H. Lipscomb, Portland District Army Engineers, announced following an initial appropriation of $4 million by Congress.

Colonel Lipscomb also announced the appointment of Robert H. Elder as resident engineer for the project. He will be transferred from Nashville, Tenn., to the Portland district.

The Dalles Dam, fifth federal project on the main stem of the Columbia River, will consist of a navigation lock, spillway, power house, and nonoverflow sections totaling 7,800 ft in length.

In plan the navigation lock on the Washington side will provide 86x675 ft clear space. It will provide a 15-ft depth of water over the sills at 5-ft drawdown. Necessary guard walls and channel improvement will be provided in the vicinity of the lock.

Fish ladders and power house collecting systems similar to those at Bonneville Dam and those being built at McNary Dam are to be installed. Downstream migrants will have access both to fish ladders and fingerling by-passes.

Initial construction probably will be cofferdams for the navigation lock and the power house.

Location of the project is at the head of the pool created by Bonneville Dam, 192 miles above the mouth of the Columbia River and 3 miles east of The Dalles, Ore. Going upstream on the Columbia it is the second of the federal series, Bonneville being the first. Above it in order, are McNary and Chief Joseph dams, both under construction, and Grand Coulee, now in full operation.

Specifications for The Dalles Dam call for initial installation of 14 generators rated at 76,000 kw each. An ultimate installation of 22 units is contemplated. First power production from The Dalles Dam is scheduled for 1957.

NEW 50 Amp Rating

ALLIS-CHALMERS 5/8% STEP VOLTAGE REGULATOR

YOU CAN PROFIT from Allis-Chalmers 5/8% step regulation in the new larger rating of the 50 ampere JFR regulator. Its low price tag holds original equipment cost down . . . makes regulation even less expensive than before . . . and gives you all the advantages of the Allis-Chalmers 5/8% step regulator line.

This means you can increase KWH consumption — and revenue, cut complaints, and increase customer goodwill. That's because Allis-Chalmers 5/8% Step Regulators hold a ± 1 volt band — give you close, accurate regulation over a 20% range.

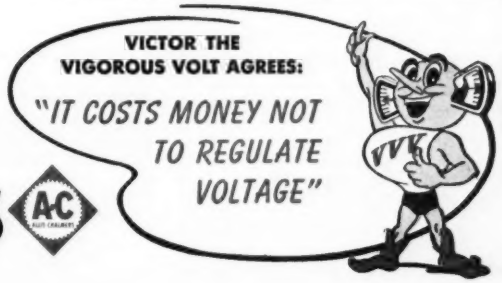
Simple Adjustment

The new 50 amp JFR regulator is fully automatic in a rating of 38.1 kva, 7620 volts, 50 amp for operation at 7960, 7200, 6900, 5000, 4330, and 2500 volts. It has a unit type control grouped on a single panel to make maintenance and adjustment easy. Only two knob settings are needed. Voltage level and voltage band can be set in less than 60 seconds.

Jump-Proof Mounting Brackets

The jump-proof mounting brackets on the new 50 amp JFR Regulator are the same as used on distribution transformers. A heavy driving motor operates under oil for tap changing. There are no commutators, slip rings, brushes, no centrifugal switch.

You are losing revenue every day you wait to correct low voltage. Call your nearest Allis-Chalmers district office today for information on how the 50 amp JFR regulator can cut your regulation costs and improve service. Or write: Allis-Chalmers, Milwaukee 1, Wisconsin. A-3393



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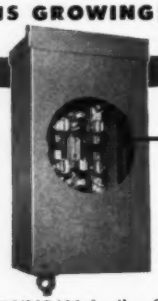

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FIRST OF FOUR PLANTS STARTED AT ALBUQUERQUE

Work has begun at Albuquerque, N. M., on the first of three generating plants the Public Service Co. of New Mexico will build in the next four years. Total capacity of the plants will be 70,000 kw.

The plant now under construction is expected to be completed within a year, at which time the second plant will be started. Cost of the two plants, which will each have a capacity of 20,000 kw, is $6 million. The third plant, to cost $4,500,000 and have a capacity of 30,000 kw, is to be started in 1954.

The Public Service's expansion program also calls for construction of a transmission line to deliver 15,000 kw from Elephant Butte Dam in central New Mexico to Albuquerque.

Fish Experts Oppose Projected PUD Development

Proposal of the Lewis County PUD for a hydroelectric development at Packwood Lake near Morton, Wash., has met opposition from the U. S. Fish & Wildlife Service and the Washington state game and fisheries departments.

The objections, made at a public hearing at Morton, were based on the future of a fish hatchery on Johnson and Hall creeks, destruction of rainbow trout by the varying level of the lake and eventual destruction of the vicinity as a primitive area. About 70 residents of the area voiced approval of the project, which would include a 70-ft dam near the outlet of the lake, a second dam on Johnson Creek and connecting flume lines to two power houses.

The PUD has applied to FPC for a preliminary permit to make engineering studies. PUD Manager Merle Johnson said eight to ten years would be necessary for completion of the project, which would have an estimated annual output of 173 million kwh, as compared to the county's present consumption of 70 million kwh.

● **The Auburn, Wash.,** city council has granted a 25-year franchise to Puget Sound Power & Light Co. for installation and maintenance of power company facilities on municipal property. A 10-year period was proposed but the power company contended that such a short period would not make improvement loans attractive to investors.

Will Defense Production Be Caught in the Squeeze?

When Congress revised and extended the Defense Production Act, it relaxed a squeeze on business profits.

President Truman asserted that this action by Congress cripples the government in its effort to prevent inflation which, as he puts it, could lead to "enrichment and profiteering for the few, economic hardship and misery for the many."

He asked Congress to rescind its action.

This editorial—the second on problems presented by "escalator"clauses—aims to throw some light on this conflict of opinion.

The Squeeze

The squeeze on profits was imposed in the name of price stabilization. The idea behind it was simple. The *selling prices* of industrial products were to be held under a tight lid. But many industrial costs are affected by "escalator" clauses of one kind or another which tend to boost production *costs*. Thus, with rising costs and fixed prices, profits would be squeezed and much of the cost of defense would thereby be shifted from those favored by escalator clauses to business concerns.

The mechanics of this squeeze on profits were complicated. But here, in brief, is how it was to work. The first step was to require manufacturers to set ceiling prices, effective May 28, for their products.

These ceiling or maximum prices were to allow for increases in manufacturers' costs that had occurred since Korea. *But they did not allow for all increases.* Manufacturers, for example, could not include increases in indirect costs—office or selling costs. Neither could they, in calculating their new prices, include increases in the costs of materials or direct labor that had come after March 15. This was the first phase of the squeeze on profits.

The second phase was prepared by **not** putting a ceiling on costs. The Wage Stabilization Board said it could not disturb the operation of "escalator" clauses by which wage rates are geared to the cost of living. Moreover, nothing could be done to curb the operation of the farmers' "escalator" clause, the farm parity arrangement. Under it, the federal government underwrites higher prices for farm products to match increases in the cost of things farmers buy. So this left wages and many materials costs free to rise against a ceiling imposed on the prices of what industry has to sell.

Relief—at a Loss

On two conditions only would the Office of Price Stabilization permit a company to raise its prices and escape this squeeze. One of these was that increased costs had more than wiped out its profits; in other words, that it was operating at a loss. The other condition was

that the industry of which the company is a part was not, as a whole, making "excess profits." That is, the industry, as a whole, could not get price relief if its overall profits before taxes were greater than 85 percent of its average profits during the best three of the four years from 1946 through 1949. Many companies expected that their profits would be cut drastically before they could get through this narrow escape hatch.

When this squeeze on profits was set up, we were told that industry as a whole was reporting record profits. But, it was equally true that wage rates and farm prices also were at record high levels. And it was also true that, under the impact of rising taxes and the dislocations caused by the defense mobilization program, profits actually were on the way down.

Profits—Going Down

By the time Congress acted to relax the squeeze, corporate profits, after taxes, were running at a rate 20 percent lower than they had been six months before. And the clear prospect was that they would continue to decline.

So the issue put up to Congress was simply this. Should business firms stand so much of the brunt of the defense costs while "escalator" clauses continued to exempt organized workers and farmers from paying their share of those costs?

But this question actually is much broader than one of fairness or unfairness alone. One certain effect of such a squeeze on profits would be to undercut the capacity of private industry to install the new plants and equipment needed for our mobilization effort. Today—unlike World War II—private industry is financing almost all of our huge program to expand production. And about two-thirds of the money that has been plowed into the expansion and improvement of our industrial machine since World War II has come out of profits.

In view of all this, Congress decided last summer to relax the pressure on profits. This was done by the controversial Capehart Amendment to the Defense Production Act. This amendment has serious administrative weaknesses. But some measure with the same purpose is needed to maintain profits at a high enough level to finance the huge and continuing expansion of our industrial machine that is now underway.

Basic Issues

As soon as the amendment was enacted, the President asked Congress to revise the law again. The heart of his proposal was to restore to the Administration the powers it used last spring to arrange the squeeze on profits outlined here.

This controversy will continue. There can be no final answer to it as long as we have the economic controls made necessary by mobilization.

But if we look beneath the surface of this technically complicated controversy, we shall see clearly that the basic issues are:

1. Whether we really shall make an effort to distribute fairly the burdens of inflation caused by our defense mobilization—

2. Whether farmers and organized workers should be exempted from these sacrifices by escalator clauses—at the expense of the nation as a whole—

3. Whether profits should be squeezed still more—at the risk of putting a fatal squeeze on the effort of industry to build new plants and install new tools. These new facilities are essential to maintaining American living standards—and they are the heart of our ability to defend ourselves and the rest of the free world.

Americans face no more important economic issues at this time.

McGraw-Hill Publishing Company, Inc.

How you can use standardized Power Transformers where "specials" seem to be required

. . . and get up to 5 months faster shipment and 8% lower price

While systems are being modified to conform more closely to EEI-NEMA Preferred Voltages, many transformer applications arise which apparently require special voltages, impedances and tap arrangements. Often, you can meet these requirements with G-E Repetitive Manufacture transformers and, at the same time, obtain attractive savings in both time and money. For example, with RM Transformers . . .

You can operate at non-standard voltages:

One optional feature of RM transformers provides that the high-voltage rating for each insulation class above 5-kv can be varied over a 20% range. This means, also, that by under-exciting you can obtain *secondary voltages* other than EEI-NEMA Preferred Voltage ratings. There may be some sacrifice in rating, of course—but you will get *more kva per dollar* than with a special transformer.

Example: You have a standard 34.5-kv primary, but want a non-standard low voltage of 2300. Select an optional RM rating of 36-to-2.4 kv. Operate at 34.5 kv. You'll get your 2300 volts.

You pay 1% for the optional voltages. You save 8% in base price. You get much faster delivery.

You can get all taps above or below the actual primary voltage:

With RM transformers, you get two taps above and two below the rated primary voltage. By selecting an optional primary rating, you can get all four taps above (or all below) your actual line voltage.

Example: Your high voltage is 34.4 kv. You want all taps below this. By selecting 32.8 kv for the primary rating, you get taps at 34.4, 33.6, 32.0 and 31.2 kv.

You pay 1% for the optional voltage. You save 8% in base price. You get much faster delivery.

You can parallel transformers with different impedances:

Impedances of RM transformers are fixed at 5.5% to 7.0%, depending on high voltage. While this affects division of load when an RM unit is paralleled with an existing transformer, it is *not* as critical as you might think. It seldom results in a serious loss of capacity. Example: You want to parallel a 34.4-kv RM transformer (impedance, 6%) with an existing unit having an impedance of 6.6%. Theoretical division of load is about 52%—48%. Often actual division will be even better than this because of external impedances. At worst, you have lost less than 5% in capacity. You have saved 8% in cost, gotten much faster delivery.

You can parallel △-Y with Y-△

While in most ratings, RM transformers are available as △-Y or △-△, a △-Y RM transformer can almost always be paralleled with an existing Y-△ unit. In fact there is one advantage: You can ground the high side through the old unit, the low side through the new RM.

You have 20 options available:

These include: optional primary voltages—load-ratio-control—bushing current transformers—fans or provisions for future fans—junction boxes, and many others. RM (Repetitive Manufacture) power transformers are available in ratings up to 5000 kva single-phase and 10,000 kva three-phase. The ratings cover all EEI-NEMA Preferred Voltages—high and low—up to 69 kv.

Let us help you apply RM transformers. For additional information call your nearest G-E representative or write for Bulletin GEC-479. General Electric Co., Schenectady, N. Y.

401-21

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

LAST LICENSE SECURED FOR TRI-DAM PROJECT

Last license needed for a proposed $40 million tri-dam project on the Stanislaus River in California has been granted by FPC. The order for a license to construct the Tulloch Dam and power house has been received by the Oakdale and South San Joaquin Irrigation districts, Stanislaus and San Joaquin counties.

Beardsley, Donnells and Tulloch dams will have a combined storage capacity of 230,000 acre-ft of water. The three power houses at the dams will have a combined generating capacity of 75,000 kw.

It is planned to finance construction of the project by a revenue bond issue based on a firm contract for sale of power to the Pacific Gas and Electric Co. Irrigation district officials are hopeful that an election can be held by the first of the year so the contract can be awarded.

GARDNER TRANSFORMERS

Peabody Brothers of Houston and Dallas, Texas, feature Gardner Transformer in their exhibit at Petroleum Industry Electrical Association Show. Personnel, l to r: W. D. Barwick, A. D. Peabody, F. J. Peabody.

DEEP IN THE HEART OF TEXAS

Gardner Transformers are an important factor in the great industrial expansion of Texas where they are sold, installed and serviced by Peabody Brothers, Sales Engineers, with offices in both Houston and Dallas, and with a technical organization that serves the entire State.

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GARDNER TRANSFORMERS GUARD PROFITS

FUELS FOR STEAM PLANTS STUDIED BY BONNEVILLE

Bonneville Power Administration is making a study of the possible use, as fuel for steam generation of electricity, of low-grade coal deposits in the Coos Bay area of western Oregon and the north central section of Washington. These areas contain large deposits of coal of such low grade that its transportation is not economically practical. Bonneville research is to determine whether or not power stations located at the mines could use the coal to advantage.

Studies now under way include the use of both coal and wood waste for power generation to supplement Bonneville's hydroelectric production. Bonneville's supplementary program calls for three 100,000-kw steam plants and five 20,000-kw gas turbine generators. It is planned to locate all these plants near the source of fuel supply.

Development of Alaska Power Sites Asked by Board

Two sites in Alaska can produce almost 2 million kw of power, the Alaska Development Board has advised Charles E. Wilson, defense mobilizer, in asking him to investigate development of electric power in the Territory for the aluminum industry.

The sites, the Taiya project and Copper River Valley in southeastern Alaska, have "complete natural protection from possible attack, yet are readily accessible to ocean navigation," the board said.

The Aluminum Co. of America has declared it is studying possible Alaska development although no immediate moves are in prospect.

USBR Considering Hydro Projects in Alaska

Bureau of Reclamation is considering construction of a hydroelectric development in the Susitna Basin north of Anchorage, Alaska, according to Joseph M. Morgan, the bureau's district manager at Anchorage. Another Alaska hydroelectric project is proposed for the Yukon River area, according to Herb Hilscher of Fairbanks, member of the Alaska Development Board. Studies are being made of the feasibility of a dam across Yukon 150 miles northwest of Fairbanks, Hilscher said.

WORK RESUMED ON LINE AFTER LONG DELAY

After a two-year delay, work has been resumed on a line from Huntington to Baker, to provide a second source of power for Union and Baker counties in northeast Oregon, it was announced by California-Pacific Utilities Co. The line will operate initially at 69,000 v but is being built for 138,000 v when needed.

Work was suspended after 36 miles of pole structures had been erected and three miles of heavy conductor put into place, all on private land. A problem of right-of-way, involving 8½ miles of public domain, which led to court action, caused the delay.

A. B. Olson, district manager of the California-Pacific Utilities Co., said that by working on a nonstop basis approximately six weeks will be required to put the new line into service.

PUD Reports It Has BPA Power Commitment

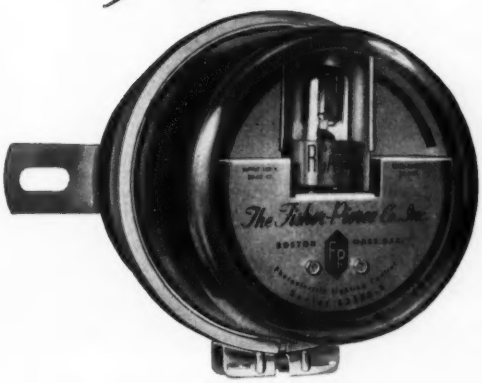
Thurston County PUD has a power commitment of 35,000 kw from the Bonneville Power Administration, contingent upon the proposed purchase of Puget Power properties being closed or agreed upon by Dec 31, the district reported last month.

Similar commitments are understood to have been made to the PUDs of Chelan, Kitsap, Jefferson, Snohomish, Skagit and Whatcom counties, other participants in the purchase plan. The Chelan and Snohomish PUDs already have acquired the company's systems in their counties but would participate in the purchase of generating plants and transmission lines, as well as the distribution systems in King and Pierce counties, where no PUDs exist.

● **Franklin County** PUD of Pasco, Wash., has awarded a $126,270 contract for construction of a single-story and basement warehouse and office building in Pasco. The building, scheduled for completion next spring, is designed so another story can be added later if desired.

● **Contract** for extension of the John Hart hydroelectric development at Campbell River, B. C., has been awarded by the B. C. Power Commission to Campbell-Bennett Ltd., 1718 W. 15th Ave., Vancouver, B. C., on a tender of $568,990.50.

Improved....



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PHOTOELECTRIC CONTROL

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This new Fisher-Pierce Control is the result of long experience in design and manufacture, combined with practical experience of more than 600 electric utilities in more than 20,000 installations.

The new 63300 B Control is mechanically and electrically interchangeable with existing controls. The same dependable Fisher-Pierce circuit, consistently giving tube life of more than 20,000 hours, has been retained. Improved spacing and insulation provides increased protection against lightning damage . . . up to 2500 volts rms Hipot. Mechanical design has been altered to provide maximum simplicity for greater economy of servicing.

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SOLA Sequenstart FLUORESCENT BALLASTS last longer

Cool operation is vital to long ballast life. Excessive heat deteriorates impregnating varnish, enamel wire insulation, compound, and invariably causes premature capacitor failure. SOLA Sequenstart* Fluorescent Ballasts last longer because of circuit design and capacitor ventilation.

• COOLER CORE AND COIL

Primary coil heat rise is significantly lower because the Sequenstart* Circuit greatly reduces the amount of metal required. This minimizes copper and iron losses, and consequently results in lower ambient temperatures. (Core and coils occupy the left section of the cut-a-way)

• VENTILATED CAPACITOR

Capacitor life is inversely proportional to operating temperature capacitor failure is the single greatest cause of ballast malfunction. The patented SOLA ventilated capacitor compartment insulates the capacitor from coil heat by two walls and a buffer of air. (Illustrated by the right section of the cut-a-way)

The important property of longer ballast life is but one of many advantages you'll receive when you specify and install SOLA Sequenstart* Fluorescent Ballasts.

Write to us if you wish to be on our Fluorescent Lighting Technical Mailing List.

SOLA Sequenstart FLUORESCENT BALLASTS

SOLA ELECTRIC CO.
4633 W. 16th St., Chicago 50, Ill.

Construction is being rushed on Cabinet Gorge plant of Washington Water Power Co. Schedule calls for completing 150,000-kw plant in November 1952, 20 months after start

Studies Are Underway on American River Salmon Run

Studies are being made by the Federal Fish and Wildlife Service to determine the best way of maintaining the American River salmon run in California after completion of Folsom and Nimbus dams. The survey being conducted for the Bureau of Reclamation may show that construction of a hatchery on the American River can be avoided, according to Richard L. Boke, USBR regional director in Sacramento.

As part of the study, an existing riffle downstream from the two dams, expected to be completed in 1954, has been altered to triple the riffle area, in hopes that it may compensate for several miles of spawning grounds from which the annual run of 15,000 fish will be cut off by the dams. Use of the enlarged riffle and the effects of high water on it will be noted.

First Salmon Go Up Ladder In U of W Experiment

First silver salmon released by the University of Washington as an experiment in 1940 have returned to the vat in which they were raised, up a fish ladder that was not there when they left.

The experiment was set up by the University's applied fisheries laboratory to study the migratory habits of fish. Silver salmon live in fresh water for 18 months, then travel to the sea, where they live until the fall of their third year, when they return to the waters in which they were reared.

Dr. Lauren R. Donaldson, laboratory director, figures the experiment will be a spectacular success if .5% of the 26,000 fingerlings that he released come back to the vat. Since peak of the run does not occur until mid-November, final results cannot be expected until late November.

● **Despite protests** that construction work at McNary and Rock Island dams worked a hardship on the fish, a record blueback salmon run went up the Columbia River to spawn this year, records indicate. More than 100,000 blueback have been counted passing Rock Island Dam near Wenatchee. Studies still are going on in an attempt to determine whether a day-long delay at McNary Dam had any harmful effect on the fish.

● **Puget Sound Naval Shipyard** at Bremerton, Wash., has received word that the Navy will transfer to Bremerton a power train capable of generating 10,000 kw to assume part of the power load at the yard. The train, now at Mare Island Navy Yard, near San Francisco, is one that has been used during the past few years in various areas to temporarily supplement power facilities. It is made up of seven cars, with boilers, turbine-generator, transformers, and tanks and operates on standard navy bunker fuel oil.

ATTORNEY WILL REPRESENT CITY AT LICENSE HEARINGS

An attorney has been hired to represent Tacoma City Light before FPC in Washington, D. C., on the city's application to build the proposed Cowlitz dams. The attorney, Northcutt Ely, also serves as general counsel for the American Public Power Assn. It is more economical to pay the attorney ($100 a day not to exceed a total of $2,000) than for City Light officials to travel to Washington, D. C., with the frequency required, according to C. A. Erdahl, utilities commissioner.

OSC Experiment Station Reports on Cloud Seeding

After a year's observation of cloud seeding in efforts to increase rainfall in three eastern Oregon counties, the Oregon State College agricultural experiment station has reported that the operations apparently did not produce significant results.

The study was financed by the state wheat commission and conducted by the experiment station with the help of the U. S. Soil Conservation Service.

Robert T. Beaumont, Oregon State College meteorologist, reported that some small but favorable departures in precipitation were noted in the seeded area, but they were not statistically significant and could have been entirely chance.

As a result of these departures, however, Beaumont has recommended that the study be continued for another year.

● **The Hilo,** T. H., Electric Light Co. no longer uses the stern of a wrecked tanker for a power plant. Generating equipment was taken ashore recently after the hulk developed a bad list. The company then sold the 2,000-ton remains, consisting of the stern section of the former T-2 type tanker, Fort Dearborn, for $32,500 to the National Metal & Steel Corp. of Terminal Island, Calif. The scrap firm plans to tow the stern from Hawaii to California as is, then cut it apart after arrival.

● **Maui Electric Co.,** on the island of Mauri in the Hawaiian Islands, plans a $2,300,000 issue of common stocks and bonds to finance expansion. It plans to more than double its present 10,000-kw capacity, with the purchase and installation of a new 11,500-kw generator.

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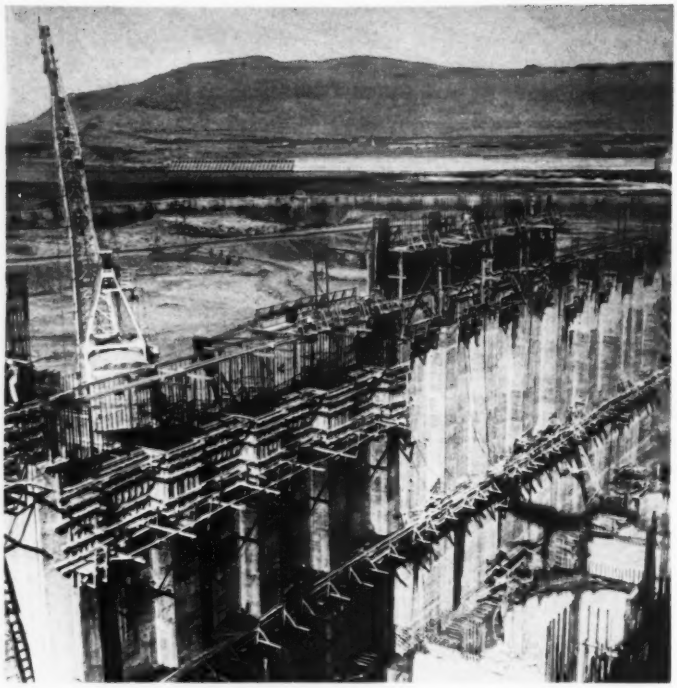

Recent view of McNary power house. First two units go in holes at lower right. McNary will help to relieve power shortage in Northwest. First unit is scheduled for December 1953

B. C. ELECTRIC GETS APPROVAL ON RATES

British Columbia Electric Co. has won final approval from the B. C. Public Utilities Commission on interim power rate increases granted for the Vancouver Island and lower mainland areas earlier this year.

Interim increase of 11.2% in residential and light industrial rates was granted March 12, and a 15% boost in commercial and industrial rates was granted on an interim basis Aug. 1.

It is now understood the company intends to apply for cancellation of flat rate increases for employees. This application, if made, will be handled by the commission as a special case later.

● **Tax** on the gross income of utilities in Washington state has been increased 10% from 3 to 3.3%, as the result of action by a special session of the state legislature.

● **The finance committee** of the Seattle city council has approved an ordinance which would authorize Seattle City Light to pay local-government units the amount of money that Puget Sound Power & Light Co. would have paid them in taxes, if City Light had not acquired the property. The ordinance was made possible by an act of the 1951 state legislature. It will involve the payment of about $400,000.

● **An order** laying off 21 federal guards at Grand Coulee Dam has been canceled by the Bureau of Reclamation "for security reasons," A. F. Darland, supervising engineer, has announced. It originally had been planned to dismiss the guards with major construction nearly completed but the bureau decided "separation of the guards at this time would impair the security of the area."

● **Central Arizona Light & Power** Co. at Phoenix has taken over maintenance for electrical distribution and equipment at the Arizona State Hospital and is rehabilitating the entire system without cost to the hospital. Calapco formerly operated only to the hospital boundary, the hospital operating its own system and hiring an electrician each time something went wrong.

COUNTIES ORDERED TO REFUND UTILITIES TAXES

The Washington Supreme Court has ordered five Washington counties to refund to Puget Sound Power & Light Co. $47,529 received in taxes from the company on properties it sold PUDs in 1948. The counties are Cowlitz, Mason, Lewis, Pacific and Grays Harbor.

The court upheld the company's contention that, since the properties were sold prior to the date the taxes were levied, the collections were improper. The counties had argued that taxes were based on ownership of the property on Jan. 1, 1948, and that disposal of the property after that date did not relieve the company of tax responsibility.

A case pending in King County involving $400,000 in taxes on the company's Seattle properties sold to City Light was to be decided on the outcome of the Cowlitz case. A third tax case is being tried in Snohomish County Superior Court at Everett.

Temporary Rate Increases Denied in Northwest

Oregon and Washington power companies have been denied temporary rate increases to meet added costs of steam generation during the power shortage.

In Washington, PUC said that the situation was completely changed by rain but that if it became critical again, the requests would be reconsidered.

The Oregon PUC, in denying requests for higher tariffs based on anticipated increased costs this winter, told the companies to reapply, asking for rates only high enough to compensate for actual losses shown on company books at the end of each month. The surcharge, if found necessary, would be set from month to month on the basis of actual operation, as approved by commission accountants.

● **The 30,000th** new electric service connection, since city acquisition of the system in 1947, was recently reported by the Sacramento, Calif., Municipal Utility District. Since Jan. 1, 1947, when the city acquired the system, $11 million has been spent on equipment, lines, and service facilities to supply an average of 526 new connections per month. This represents an investment about equal to the appraised value of the system when the city took over, it is stated.

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CITY LIGHT REPORTS ON INCREASE IN PAY ROLL

Pay roll of Seattle City Light will increase to $8,813,167 Jan. 1, as the result of wage increases and increased employment resulting from the acquisition of Puget Sound Power & Light Co. properties.

Adjusted 1952 salaries, less positions created by the merger, total $6,458,917, an increase of 8.63% or $513,162 for the same positions before the merger. Employees taken over in the merger get the same wage as City Light workers in the same classification, but the exact amount of money increase they will realize cannot be computed because the company's position classification was different.

The salary increases granted City Light's personnel apply to all employees in the same job classification in other departments. However, the Municipal Employees' Union accepted under protest the wage scale for City Light laborers, charging the new scale of $255 a month in that classification is lower than that paid in other Seattle municipal departments and in other Pacific Coast cities.

The new budget includes, for the first time, a wage and working conditions agreement between the city council and 21 unions representing employees.

City Light's sales rose to a new records. Revenue for August totaled $1,857,846 an increase of 85% over the same month a year ago, before the city acquired Puget Power properties. Operating expenses meanwhile have increased only 65%.

Total number of customers increased 87,189 to 205,649, of whom 99,285 are on the all-electric rate, an increase of 58,365. Electric ranges increased 58,365 to 143,637; electricity used by customers, 74,269,000 kwh to 153,283,000.

● **Local 77** of the Electrical Workers' Union, AF of L, at Seattle, has ratified an agreement with the Seattle City Council granting wage increases to City Light employees. First between the union and the city, the contract provides for an increase of 8.9% over the former scale. Hourly scale for journeymen linemen was increased from $2.25 to $2.45, effective Jan. 1.

● **Employees** of the Cowlitz County PUD at Longview, Wash., have voted to participate in the state employees' retirement system at a cost to the PUD of $50,000 annually. Commissioners of the PUD previously had approved the plan.

An electric control that is accurate within one-fifth of a degree is a recent Puget Sound Power & Light Co. farm electrification development. The control is used in cooking daffodil bulbs to kill pests — a process that requires temperature of a formaldehyde solution to be held at 110° for three hours. At 109° treatment is ineffectual, at 111° bulbs are damaged. The problem was solved by using a special thermostat built to specification and a system of controls. A thermostatically controlled solenoid valve injects steam, while a propeller circulates the water uniformly. If the temperature varies one degree, an alarm sounds. Electric hoists lower and raise crates into the cooking tank, which holds ten tons of bulbs in 400 50-lb flats. Glen Cushing, Puget Power agriculture engineer, adjusts controls at the Francis Chervenka bulb farm near Puyallup, Wash.

● **Seattle City Council** has approved a $53 million bond issue to finance a City Light expansion program. Bids for the first $28 million block are expected to be opened Jan. 8. Maximum life of the bonds in the first series will be from 18 to 31 years, in the second from 18 to 35 years. Actual amount of annual bond redemption payments will be fixed by a city council resolution adopted as each block is sold, a departure from past practices.

● **FPC** has amended the license of California Oregon Power Co. for its North Umpqua hydro project to include a new dam and power house located on Fish Creek in Douglas County, Ore. The addition will increase installed horsepower capacity from 96,800 to 112,200 hp.

NEWS ABOUT PEOPLE

Sherwin Succeeds Holloway As San Diego G & E Head

Emery D. Sherwin has been advanced to president of San Diego Gas & Electric Co., from vice-president in charge of operation, upon the retirement, Nov. 1, of **A. E. Holloway,** it was announced by **L. M.** Klauber, chairman of the board of directors and chief executive officer. **Harold A. Noble,** general superintendent since 1947, has been advanced to vice-president in charge of operation.

A. E. Holloway retires after 41 years of service, begun as an appliance salesman in 1910. In 1911 he was made manager of new business, commercial superintendent in 1921, vice-president in charge of sales in 1932 and president in 1949. He was instrumental in organizing the Electric Club of San Diego and the Bureau of Home Appliances.

Sherwin started with the company in 1915 as chainman, served as draftsman, clerk, surveyor, inspector, assistant superintendent of electric transmission and distribution, of electric production, assistant to the general superintendent and then general superintendent in 1941, vice-president in charge of operation in 1944, a director since 1944. He is now president of Pacific Coast Electrical Assn.

Noble started with the company in 1925 and has served as construction engineer, assistant superintendent of electric production and superintendent of electric production.

Sherwin

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● After 40 years in the electric utility business and 26 years as an officer of Central Arizona Light & Power Co., **Edward H. Coe** retired on Oct. 1. Because of his outstanding service, he was named honorary chairman of the executive committee and will continue to serve as a member of the board of directors. Coe joined Calapco in 1925 as vice-president and general manager; became president in 1934; was forced through ill health to resign the presidency in 1946. He guided the company from a small firm, which in 1930 served 33,912 customers in and around Phoenix, to its present size. Calapco and its Northern subsidiary now serve more than 150,000 customers in a 28,000-square-mile territory. Among his accomplishments are the Parker power contract and the transfer of the company from its former holding company owners to local control and management. Since his retirement from the presidency, he has been chairman of the board's executive committee and supervisor of general corporate matters of the company.

● **Adam S. Bennion,** vice-president of Utah Power and Light Co., has been chosen to head a group of Utah citizens who, by legislative authority, are to conduct a year-long survey of the public school system in the state. The committee, set up by a special session of the state legislature, is to inquire into administrative and fiscal policies, teacher salaries, uniform accounting practices, property values, school facilities and statutory reforms.

● **J. P. Jones** has been appointed acting regional engineer, Region 3, Bureau of Reclamation, with headquarters at Boulder City, Nev. **Charles A. Bissell,** regional engineer, retired after 34 years service with the bureau. Jones, who has been with the bureau some 20 years, has been Bissell's assistant since 1945. Bissell has been awarded the Department of the Interior's distinguished service medal in recognition of his "consistently exceptional performance of duty and outstanding service in administration."

● **Ampex Electric Corp.** has appointed **Harrison Johnston** manager of its newly created product engineering division. Johnston will headquarter at the company's Redwood City factory. He has been associated with General Electric for the past 12 years and recently has been in G-E's San Francisco office.

Carr

● **Harold F. Carr** has been appointed manager of the personnel department of Pacific Gas and Electric Co., succeeding the late L. J. Nevraumont. Carr has been acting as executive secretary of the Pacific Service Employees Assn., a voluntary organization of PG and E employees. He joined the company in 1930 in the East Bay division.

● **Luther "Lou" Miller,** head of the electrical department of the City of Vancouver, B. C., has retired after 35 years' service. Born in Indiana, Miller came West and punched cattle in California, then learned the electrical trade in mining towns of Nevada and Oregon. He went to Vancouver in 1914 and worked as a lineman along with Fred Hume, now Mayor of Vancouver and head of the electrical construction firm which bears his name. In 1916 Miller joined the city electrical staff as a journeyman electrician, and in 1943 he was appointed head of the department.

● **Don Lauckhart,** formerly with the Puget Sound Power & Light Co., has joined the Grays Harbor PUD of Aberdeen, Wash., as electrical engineer.

● **Robert T. Skeer,** appliance sales representative for General Electric Co. at Kansas City since 1946, has been transferred to Seattle, as manager of major appliance sales.

● **Charles R. Lund** of La Crescenta, Calif., has been appointed sales engineer in the Los Angeles district office of Tinnerman Products.

● **Dan Naso-Dyke** has been appointed manager of Boulevard Radio & Electric, 5787 Victoria Drive, Vancouver, B. C.

● **Dennis J. Murphy,** assistant manager of commercial and industrial power sales for the Department of Water & Power, Los Angeles, has been made assistant to **Johann M. Gumz,** former industrial sales manager, Pacific Gas and Electric Co., who is now chief of the Utilization and Conservation branch of the Defense Electric Power Administration with headquarters at Tacoma, Wash.

● **Walter Brenton,** superintendent of production, and **Howard Arnett,** purchasing agent, of Portland General Electric Co., have been advanced to assistant general superintendents. Brenton will retain his power production duties. **Fred G. Hodge,** former general division manager of PGE, will take over Arnett's position of purchasing agent.

● **Louis A. Haugh,** advertising and sales-promotion manager, Leo J. Meyberg Co., appliances, Los Angeles, has been promoted to assistant to the general manager of the company. **George W. Oliver,** formerly director of advertising and promotion, Packard-Bell Co., radio and television manufacturer, succeeds Haugh.

● **George S. Erskine,** electrical engineer, Redwood City, celebrated 25 years activity in the building industry, first as a wireman, then a contractor, and lately as a consulting electrical engineer, by having a cocktail party for his friends and associates Aug. 31.

● **Roy E. Crews** is now Pacific Coast district transportation supervisor for the engineering and service department of Westinghouse Electric Corp., with headquarters at San Francisco. He was transferred from Pittsburgh, where he was consulting and application engineer for the department.

● **Charles C. Gadsby** has left the advertising and publicity department of Pacific Gas and Electric Co. to become public relations and advertising manager for the Marchant Co. in Oakland. Gadsby is the son of **George M. Gadsby,** president of Utah Power & Light Co.

● **W. G. Wehe,** formerly with Graybar in San Francisco until his transfer to Boise in 1946 as operating manager, has now been appointed district operating manager for Graybar Electric Co. at Detroit by A. H. Nicoll, president of the company.

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● **C. P. "Charley" Johnson,** who for 11 years has headed Westinghouse Electric Corp.'s Western Publicity division, last month was transferred to New York as Eastern Publicity division manager. Taking his place at San Francisco is **Carl Albracht** of Bloomfield, N. J., a former newspaper and wire service man, who for several years has been publicity representative for the company's lamp division.

● **W. D. Vincent** has joined the Seattle General Electric apparatus division as an application engineer. A specialist in the application of heavy equipment for the lumber, plywood and paper industries, Vincent has been with the company since 1940. Another change is the transfer of **F. J. Downs,** expediter-in-charge for the Portland order service division, to Schenectady, where he will head the utility section of the same division.

● **Burton B. Pierce Jr.** of Seattle has been appointed Pacific Coast special representative for the Bendix Home Appliances Division, Avco Manufacturing Corp. Most recently branch store manager for MacDougall-Southwick, he previously was president of Distributors Inc.; spent five years with Harper-Meggee Inc., Bendix distributors in Seattle, and managed the appliance department of the Bon Marche.

● **William J. Paul** was appointed executive secretary of the Pacific Gas and Electric Co.'s employees organization, Pacific Service Employees Assn., with nearly 17,000 members. He succeeds **Harold F. Carr,** whom the company appointed personnel department manager. The association carries on a disability plan, wage benefit plan in event of sickness, hospitalization plan, credit union and education, athletic, social and other activities.

● **Thomas K. Hawkins,** for two years an application engineer in the Allis-Chalmers substation section, has been made a sales representative in the manufacturer's Los Angeles district office. Hawkins, who joined Allis-Chalmers in 1946, received the company's 1948 graduate fellowship award for study on the network calculator at Illinois Institute of Technology.

● **G. Ross Henninger,** former engineering editor of ELECTRICAL WEST, has been appointed assistant director of the engineering extension service at Iowa State College. He will have charge of adult education activities carried on by the college throughout Iowa.

● **Robert A. Neal,** vice-president and general manager for Westinghouse Electric Corp.'s Pacific Coast district, has been recalled temporarily to Pittsburgh headquarters to assist in the company's over-all defense and expansion programs.

● **Paul E. Potter,** Oregon State College, won a third award of $276.25 and a $250 scholarship for a paper, "An All-Welded Steel Bridge," under the James F. Lincoln Arc Welding Foundation. Several other Western engineering students won minor prizes and awards.

● **F. E. Blair** has been appointed lamp supervisor for Westinghouse Electric Supply Co. in the southern California district. He was formerly in the same position in the branch office in Los Angeles.

Deaths

● **Charles Z. Yost,** assistant manager of electrical operations for Pacific Gas and Electric Co., San Francisco, was fatally stricken by a heart attack as he was watching the football game between his alma mater, University of California, and USC, Oct. 20. He had been with PG and E since graduation, 37 years ago. A native of Minto, North Dakota, born in 1889, Mr. Yost served in World War I as a lieutenant in the Army. He took active part in PCEA and San Francisco Electric Club activities.

● **Theodore P. Soderback,** 53, chief engineer for the steam heat division of Puget Sound Power & Light Co. at Seattle, died Oct. 2. He had been with the company since 1923. The plant he managed has just been sold to a group of Seattle businessmen.

● **Bernard I. Valentine,** 38, an Idaho Power Co. engineer, was killed in an airplane crash Sept. 23. Valentine had been with the Idaho Power Co. 15 years. During World War II he served as a lieutenant commander in the Navy.

● **Arnold Friend,** retired sales manager and treasurer of the M. B. Austin Co., and winner of the James H. McGraw award for manufacturers, died of heart attack Oct. 16 in Los Angeles. He was born in 1877.

NOTES ON THE TRADE

● **General Electric Supply Corp.** has established a central California district, with headquarters in Fresno, at 1234 O St. District manager is **William L. Duncan,** branch manager at Fresno when it was part of the San Francisco district. **K. Kenneth Graff** is in charge of appliance and electronic sales. Included in the new district are Fresno, Kings, Madera, Mariposa, Merced, Tulare and San Luis Obispo counties, all of Kern County north of the Tehachapi Mts. and the extreme southern part of Santa Barbara County.

● **George Hondlik** has joined the Clyde Allen Co., with headquarters in the Western Merchandise Mart at San Francisco. He will work in the northern California territory, with specific responsibility for B&R Electronics Co., Fresh'nd-Aire Co., Television Furniture Division of Gravely Furniture Co. and Waxmaster. He formerly was Minneapolis manager for Miles, Nagel & King, Chicago manufacturer's representative.

● **Allis-Chalmers Mfg.** Co. has a new 16-mm sound and color film showing uses of induction heat in industry. Running time is 20 minutes. Prints are available for group showing upon request to the manufacturer's advertising and industrial press department, General Machinery Division, Milwaukee, Wis.

● Appointment of **Tri-State Supply Corp.** as factory representative for Potter & Rayfield Inc. in California, Arizona and Nevada was announced recently. Tri-State has offices at 544 S. San Pedro St., Los Angeles and 554 Bryant St., San Francisco.

● **H. L. Bilsborough** of Los Angeles, assistant marketing director for A. O. Smith Corp., was one of five executives to attend the company's two-day course at Milwaukee on application, sizing installation and servicing of Smith water heaters.

● **Slater Electric** & Mfg. Co. Inc., Woodside, N. Y., has appointed the George Magnes Co., 725 2nd St., San Francisco, as its representative in northern California and Nevada.

● **Benbow Mfg. Co.** moved on Oct. 1 to a new factory and office building at 1285 Rollins Rd., Burlingame, Calif.

There's Longer Life in Pressure-Creosoted

POLES by McCORMICK & BAXTER

Straight, Strong Durable
OREGON DOUGLAS FIR
Poles • Piling • Lumber • Ties • Crossarms

• Machine Peeled
• Full-length Pressure Treatment
• Manufactured Uniformity
• Immediate Delivery

McCORMICK & BAXTER CREOSOTING CO.

PORTLAND — Board of Trade Building • ATwater 2346
SAN FRANCISCO — 485 California St. • DOuglas 26771
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Treating Plants.
PORTLAND, ORE
STOCKTON, CALIF.

It Pays to Advertise in Electrical West

The epic story of population and industry migration Westward rivals the gold rush migrations of 1849-50. Added to the already rich and stable market afforded by the region, they make the West the nation's pre-eminent market for electrical equipment, materials and appliances. These are the factors that warrant special SALES and ADVERTISING attention to this market. ELECTRICAL WEST blankets the market, completely and intensively and its value as a sales builder is attested by 261 advertisers who regularly use its pages to pave the way for their salesmen.

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ELECTRICAL INSULATING MATERIALS
Varnished Cambric
Cotton Tape, Sleeving
Fibre, Fish Paper
Laminated-Bakelite
Slot Insulation
Extruded Tubing
•
Send for free catalogs & literature
•
Four convenient warehouses
Serving 11 Western States

ELECTRICAL SPECIALTY CO.

SAN FRANCISCO 3
316 Eleventh Street
HEmlock 1-5116

LOS ANGELES 13
418 E. Third Street
Michigan 1907

SEATTLE 4
2406 First Ave. So.
ELiot 8061

DENVER 2
1015 Twenty-first St.
CHerry 4588

MOTORS, GENERATORS, TRANSFORMERS
1 — 1500 H.P.
Bought and Sold
New and Rebuilt
ELECTRIC EQUIPMENT CO.
ROCHESTER 1, N. Y.
Cash For Your Surplus

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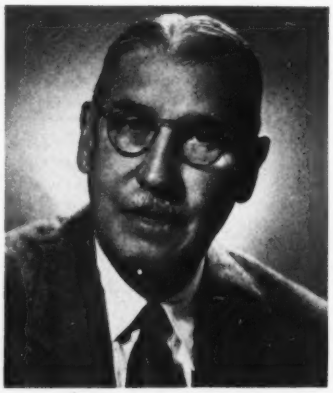
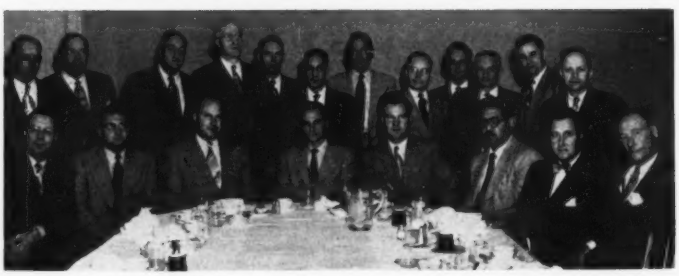


Edward H. Coe, president of Central Arizona L&P Co. until ill health forced his resignation in 1946 and since then chairman of the board's executive committee, retired from active service on Oct. 1. He was made honorary committee chairman

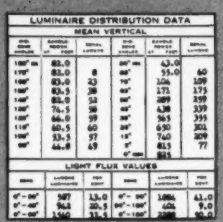
Below, three members of the San Francisco Pot & Kettle Club appear to have made Life's cover. Actually, Bruno Kaufner, E. B. Happoldt and Earl Robitscher (shown left to right with Master of Ceremonies Fred Wood) were being given life membership in the club in special ceremonies at the Western Merchandise Mart. A picture showing the three at a national Pot and Kettle Club convention about ten years ago was superimposed on a facsimile of the Life magazine cover



Appliance service executives at S.F. luncheon of NASA: Standing, rear row: Jack Lorge, Urners, Bakersfield; Les Smith, D&S Repair, San Jose; C. G. Reynolds, Grabe Electric, Tucson; Julius Hooper, Seattle; H. R. Rieschel, Appliance Service Factors, San Francisco; Bill Dumas, W. L. May Co., Portland; Garth Chamblin, California Electric Service, S.F.; Charles Evans, Will Aronsen Co., S.F.; Harry Parmelee, G-E Appliance Service, S.F. Center: Will Aronsen, San Francisco; Clay Hardy, Calif. Elec. Serv., S.F.; Carl Bressie, Bressie Electric, Portland. Seated: Harry Harlow, parts manager, Ned Donnell, service manager, Calif. Elec. Serv., Los Angeles; Al Hayes, Universal regional service manager; Keith Chamblin, Calif. Elec. Serv., Los Angeles; Chet Coppin, Lamco Electric, Sacramento; Tom Rico, Calif. Elec. Serv., Long Beach; Ben Morden and Fred Wood, manufacturers agents, San Francisco. See story of the two-day NASA meeting on page 94

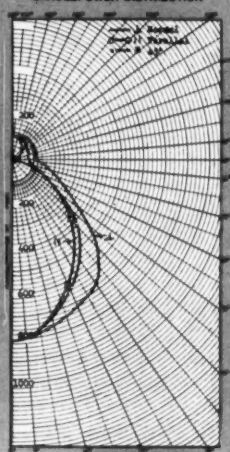
Specify FLEUR·O·LIER

Coefficients of Utilization



These enable the specifier to select the proper unit for the job.

CANDLEPOWER DISTRIBUTION



A complete photometric test of the luminaire is provided.

and know what lighting you'll get

It isn't necessary to *hope* you'll get satisfactory lighting from your fluorescent installation. Specify FLEUR-O-LIER equipment and you'll get these advantages:

1. FLEUR-O-LIER luminaires have been assigned a Fleur-O-Lier Index System rating by Electrical Testing Laboratories, Inc., after careful testing. This rating tells the exact illuminating characteristics of the unit. Complete photometric data and coefficients of utilization are provided.

You know what you're getting

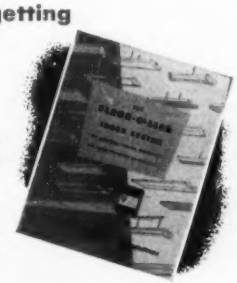
2. FLEUR-O-LIER luminaires are certified by ETL to assure they meet rigid specifications covering mechanical and electrical features. They all use CERTIFIED BALLASTS and CERTIFIED STARTERS.

You know what you're getting

Free Booklet

Write for your free copy of the new booklet giving complete details of the Fleur-O-Lier Index System.

Ask also for Electrical Testing Laboratories' report on performance ratings assigned to the 300 Fleur-O-Lier fixtures.



The Fleur-O-Lier label indentifies units that meet precise specifications and are ETL certified.

FLEUR·O·LIER *Manufacturers*

2116 Keith Building • Cleveland 15, Ohio

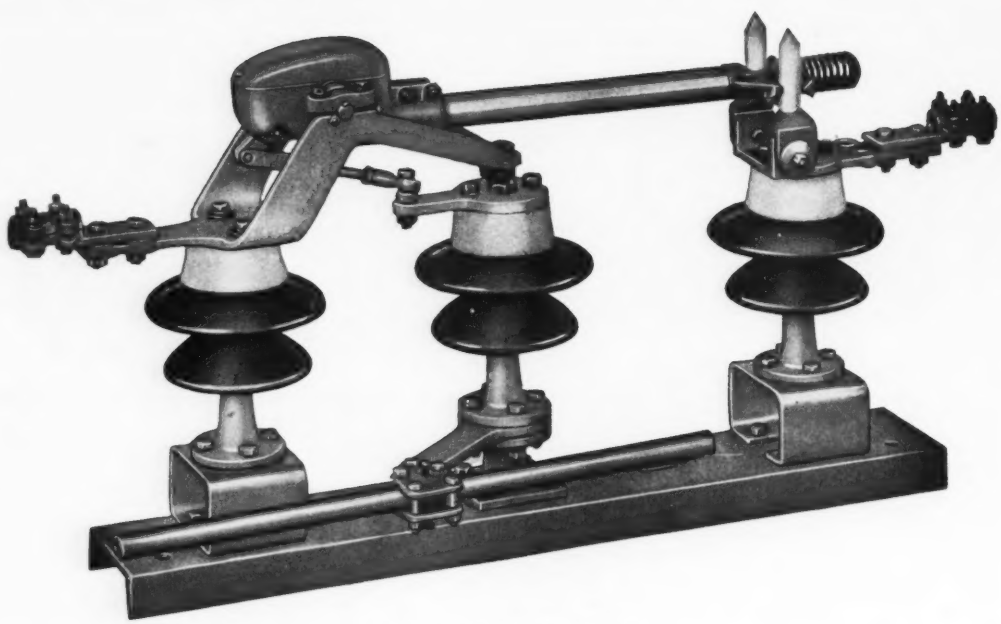
Fleur-O-Lier is not the name of an individual manufacturer, but of a group of fixtures made by leading manufacturers. Participation in the Fleur-O-Lier program is open to any manufacturer who complies with Fleur-O-Lier requirements.

Cole Electric Co.

8439 Steller Drive Culver City, Calif.

TExas 0-4701

Tests made in our laboratory under severe icing conditions show the switch illustrated below, closed (left) and after opening (right). Ice was over 1″ thick: Only 450 inch pounds were required to open switch.



AIR BREAK DISCONNECTING SWITCH
15,000 Volts, 600 Amperes, Type 0-2
Vertical Break, Three Pole, Single Throw, Group Operated
SILVER TO SILVER CONTACTS

"Planned lighting gave us as much as 15% production increase..."

writes Mrs. Maude R. Bailey; Chas. M. Bailey Co.

Spotlights mounted on each machine give intense light for easy vision at critical tool point

Does planned lighting pay? The Chas. M. Bailey Co. of San Francisco writes: "... after the installation of the new lighting system we were very pleased, and feel quite positive it made as much as 15% increase in our production.

"The best recommendation for the new lighting was by one of our skilled mechanics, who stated: 'Before the new lights were installed, nobody wanted to work the night shift even for a premium. Now we all like to.'"

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

Whatever your business

Good Lighting Is a Good Investment

Increases production, sales

Reduces waste

Keeps employees happy, efficient

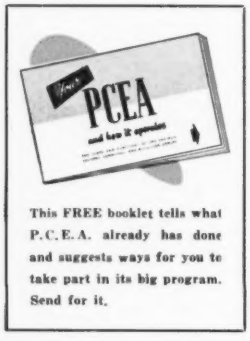
Reduces accidents

Increases cleanliness

For a survey of your lighting and ideas on how better lighting can help you, call the lighting engineer at your P. G. and E. office, or consult your contractor or engineer.

ONE OF A SERIES OF ADS TELLING HOW YOU CAN MAKE YOUR P.C.E.A. MEMBERSHIP PAY DIVIDENDS

Watch the Girls go by!



This FREE booklet tells what P.C.E.A. already has done and suggests ways for you to take part in its big program. Send for it.

When it comes to "doing something" in P.C.E.A.—a *do something* outfit—you have to hand it to the girls. At the L.A. convention last summer the Home Economists' program was the biggest hit of all.

Here's what they've done in 1951:

STAGED two, 2-day workshops for home economists working in the electrical industry;

CONDUCTED eight Electrical Living Institutes for teachers;

DEVELOPED a set of classroom demonstrations for use by utility home economists in their work with schools;

PUBLISHED a classroom textbook on the electric range, "Know Your Electric Range," to be distributed to schools for use by home economics teachers.

Men of action . . here's a challenge! Here are *women of action* . . solving problems in their fashion . . doing something for the good of the whole industry, as well as for people who need to know more about home economics.

PACIFIC COAST ELECTRICAL ASSOCIATION

601 WEST FIFTH STREET, LOS ANGELES 17 — 447 SUTTER STREET, SAN FRANCISCO 8